

H-34 Choctaw

in action



Aircraft Number 146
squadron/signal publications

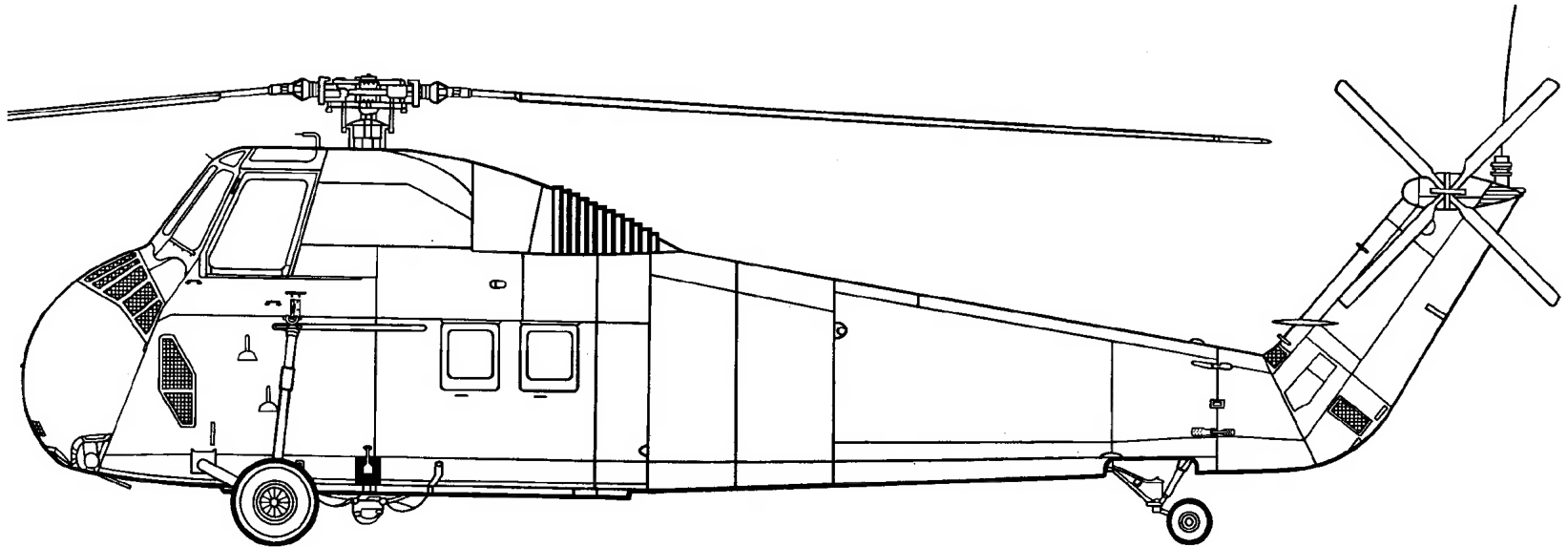
H-34 Choctaw

By Lennart Lundh

in action

Color By Don Greer

Illustrated by Joe Sewell & Lori Basham



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The last HSS-1 Seabat flown by the Force Aérienne Belge (Belgian Air Force) was painted in this special scheme to celebrate the type's twenty-five years in service (1961-1986).

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Dedication

For Lin, who does more than just tolerate my interests.

Acknowledgements

No one can research the history of an aircraft that has served in more than forty countries over as many years without incurring tremendous debts of gratitude. My thanks go to the U.S. Foreign Service officers and the Embassy and Consular officials of dozens of countries, who knew the right doors to knock on. Thanks are also due to the seemingly countless representatives of archives, government agencies, manufacturers, military forces, museums and operators around the world who answered questions and provided material. I would like to especially mention the following individuals for their assistance in providing information and photographs:

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UH-34Ds insert troops during a training exercise. The low visibility markings and Olive Drab camouflage finish are contrasted by the high visibility full color national insignia. (Sikorsky Aircraft)



Introduction

In 1952, practical military helicopters were barely a decade old; however, the strides made in that time had been phenomenal. The limited-range, small-payload aircraft introduced in wartime Europe and America had given way to such types as the Sikorsky H-19 and Piasecki H-21. The former, first flown on 10 November 1949, was proving to be a capable performer in the war on the Korean peninsula. The latter, just entering production, was in great demand from the Air Force and Army. Moving troops or hauling cargo, carrying out rescues or protecting the Fleet, the helicopter's potential was unlimited.

The HO4S-1, as the Navy designated the H-19, was in use with the Fleet as an anti-submarine warfare aircraft. The first American production ASW helicopter, its success in creating doctrine and tactics also highlighted its shortcomings. Requirements for greater power and longer range caused the Navy to begin searching for the HO4S-1's successor only a year after its introduction. Bell and Sikorsky both entered the competition for the new design. Bell's entry was the HSL-1, a tandem rotor design with the cockpit in the nose, a centrally located cabin, and an aft mounted engine. Their only twin-rotor aircraft, its resemblance to Piasecki's H-21 reflected a branch of design which has carried on through to the H-46 and H-47. It was the first helicopter designed from the start for ASW work, but it possessed serious faults. Its size made it awkward for shipboard use and excessive cabin noise levels interfered with sonar operation. Contract cancellations, including all Royal Navy orders, resulted in only three prototypes and 50 production aircraft being built between 1953 and 1956. Most were mothballed upon delivery. Six were modified at NATC Patuxent River, Maryland for use in mine countermeasure experiments. These served with the Naval Air Mine Defense Development Unit at Panama City into the 1960s.

The predecessor of the H-34 was the Sikorsky H-19, which was used by all branches of the American armed forces along with a number of foreign users. This SH-19A was equipped with "Hot Dog" floats and was assigned to the Air Force Air Rescue Service. This aircraft (51-3867) was one of fifty H-19As produced. (United Technologies)



The Sikorsky design was their model S-58, a design that, over a twenty-five year period, was produced by three companies, and had productions runs of 1,821 by Sikorsky, 185 by Sud Est in France, and 395 by Westland in England. The type would see military and civil use in over four dozen countries. The HSS-1 possessed none of the faults found in the HSL-1 and was highly adaptable. Navy contracts for the HSS-1 Seabat were followed by Marine Corps orders for the HUS-1 Seahorse transport.

Air Force and Army competitions pitted the S-58 against the H-21. In both cases, the H-21 was chosen, leading to production of 564 aircraft in six variants. While the Army preferred the Shawnee, Piasecki production; however, was completely absorbed by Air Force orders. As a result, the Army ordered the S-58 as the H-34A Choctaw.

All H-34s, as the military versions of the S-58 were known after September of 1962, shared a common design. The magnesium skinned fuselage was of all-metal, semi-monocoque construction with the low tailboom extending from the main cabin. A four blade, all-metal main rotor was driven, through a transmission mounted on top of the fuselage, by a 1,525 hp Wright R1820-84 series Cyclone air-cooled radial engine. This engine was mounted in the nose, behind large clamshell access doors, at a 34 degree angle from the vertical. Cooling was provided by large, screened intakes on three sides. The shaft from engine to transmission ran through the high cockpit, between the pilot's and co-pilot's seats. The four blade all-metal tail rotor was driven by a shaft running along the top deck between the transmission and the tail rotor pylon. Landing gear was non-retractable, with the main gear set behind the engine compartment and a fully swiveling tail wheel mounted just forward of the folding tail rotor pylon. Access to the cabin was through a single aft-sliding door on the starboard side. Cockpit entry could be gained via external kicksteps on both sides of the forward fuselage. Passage between cockpit and cabin was arranged by folding the bottom of the co-pilot's seat up and climbing through the resulting gap in the cockpit floor. In emergencies, the windows mounted in the cabin walls could serve as exits.

The main cabin, in the ASW versions, housed an AN/AQS-4 or -5 sonar unit and its operator. A well was provided in the cabin floor for the dunking sonar head. As a personnel trans-

Total production of the Piasecki H-21 was only a quarter of that of the H-34. Both aircraft had their staunch and unshakable advocates, and both served their users well in both war and peace. This H-21B (52-8683) was transferred from the Air Force to the Army. Painted in Olive Drab with Red-Orange nose and tail, it is currently preserved at the EAA museum in Wisconsin. (Author)



port, the H-34 could be fitted with seating for twelve or eighteen combat equipped troops. In the eighteen-seat configuration, the seats across the cabin door folded out and down to form steps. For medevac purposes, eight litters, in two stacks of four, could be installed. Skid rails and tie down rings were provided for cargo missions.

Compact stowage was required for shipboard operations. To accomplish this, the main blades folded back along the fuselage, two to a side, by way of knuckles at the rotor head. The tail rotor pylon was hinged to swing 180 degrees to the left and rest against the main boom.

Exceptions to the pylon arrangement were found on the S-58C, which was intended for airline use and did not need compact stowage, and on most S-58Ts, as a weight-saving measure.

For ASW missions, the HSS-1 could carry two acoustic homing torpedoes. These were mounted externally on variable angle racks. Because doctrine did not call for transports to be armed, there were no factory provisions for mounting weapons on the H-34A and HUS-1.

All-weather, night-flying operations were made possible beginning in 1958. The HSS-1 was given auto-stabilization, hover coupling and Doppler navigational equipment, resulting in a change of designation to HSS-1N. A number of H-34As were also fitted with the same equipment as the H-34C.

In separate experiments, Sikorsky, Sud Est, and Westland installed turbine engines in H-34

airframes. While the Sikorsky and Sud Est versions did not see production, they were influential in later designs. Westland's activities led to the famous Wessex helicopter.

It speaks well for the versatility of the H-34 that no single type replaced it. The Seabat's ASW role was filled by Sikorsky's SH-3 Sea King, while vertical replenishment (vertrep) and other transport tasks were given to the Boeing CH-46 Sea Knight. In Army service, the Choctaw gave way to the Bell UH-1 Huey and Boeing CH-47 Chinook. As a Marine transport, the Seahorse's successor was the Boeing UH-46 Sea Knight. Coast Guard SAR requirements were met by the Sikorsky HH-52 Pelican. The Presidential transport role of the VH-34s went to the Sikorsky VH-3.

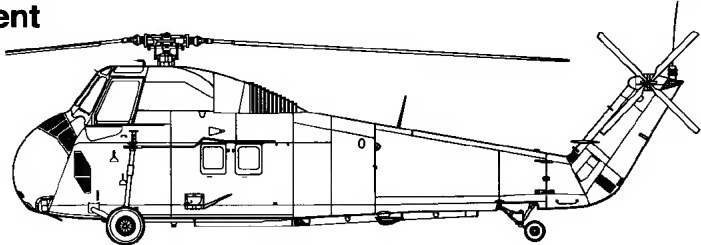
There was an abundance of designations—over two dozen, not counting the 1962 Tri-Service changes and many inter-service transfers took place. Virtually all models were in production simultaneously, with changes designed for one often found in others. Still, there are only four main limbs to the H-34 family tree. First is the Seabat, initially built as HSS-1 and HSS-1N for the anti-submarine role. Second is the Choctaw, the Army's H-34A with its upgrades and foreign counterparts. Third is the Seahorse, the Marine Corps HUS-1 utility helicopter and its derivatives. Fourth is the S-58, the primarily civilian variants being the S-58B and S-58C models, along with aircraft converted to S-58T standards with turbine engines.

If Bell Helicopter's HSL-1 had been smaller and quieter, the HSS-1 (H-34) might never have entered production. Because of its faults, only a few were built and these were mainly used in test work. This HSL-1 is engaged in towing tests. (Bell Helicopter Trextron)

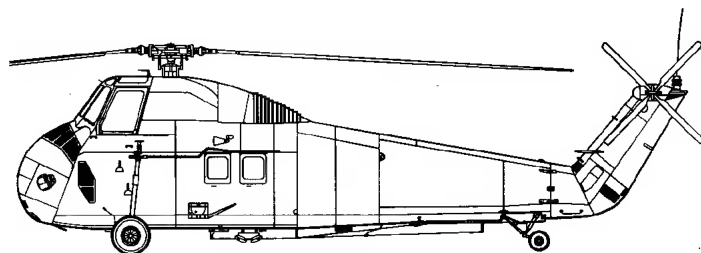


Development

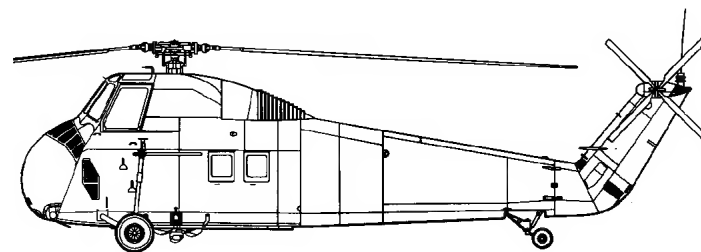
HSS-1



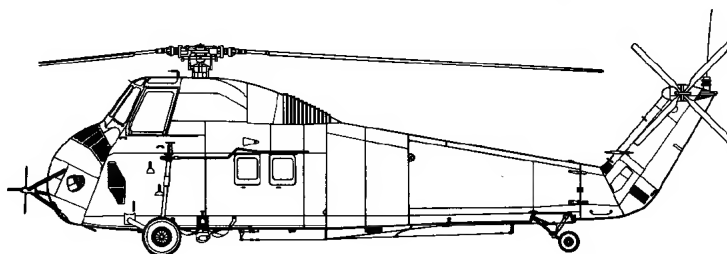
HSS-1N



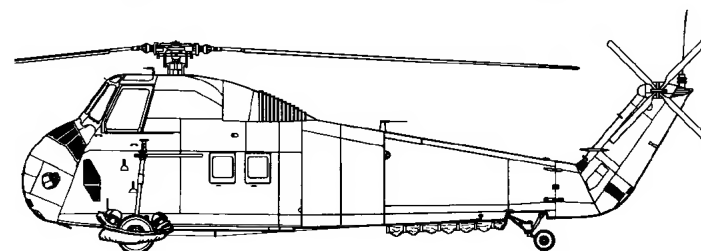
H-34A



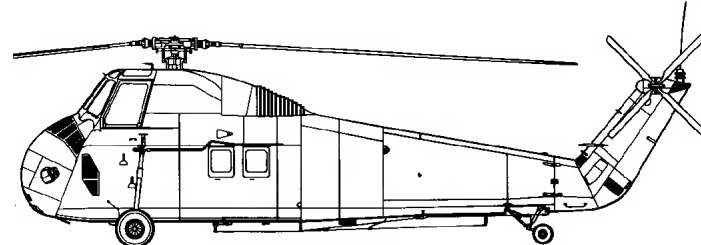
H-34C



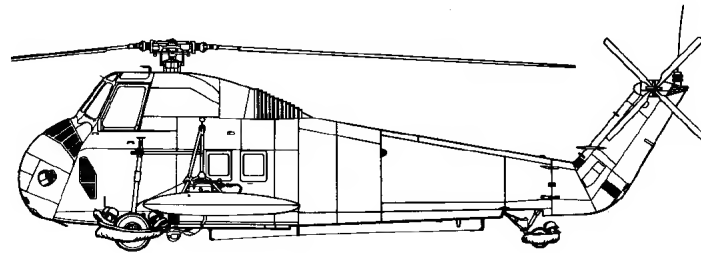
VH-34A



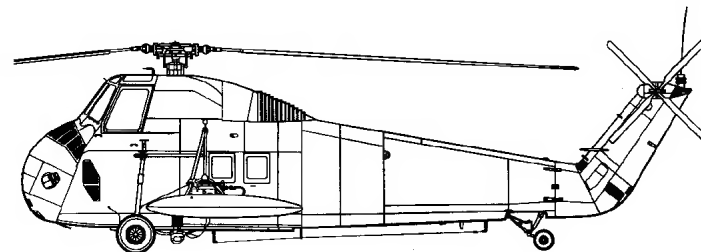
UH-34D



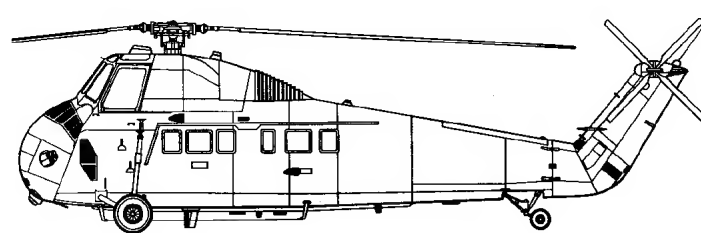
HUS-1A



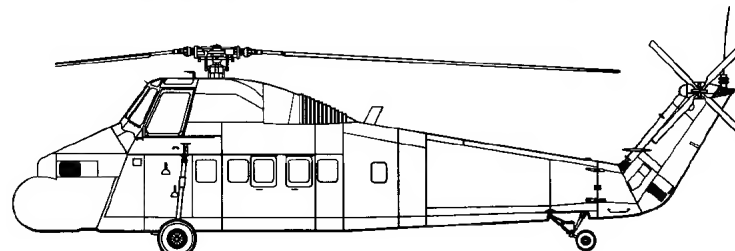
HUS-1G



S-58C



S-58T



HSS-1/SH-34G

In Army and Marine Corps service, the H-19 had proven its worth as a transport during the Korean War. As an ASW platform; however, it suffered from a number of problems.. Under powered, it had neither the loiter time nor the lift capacity to provide a true deterrent screen for the Fleet. At the same time that the H-21 and H-34 were competing for Air Force and Army contracts, Sikorsky's new ASW capable HSS-1 was engaged in trials against Bell's HSL-1. The HSL-1 was initially judged superior, but excessive cabin noise levels caused the production contracts to go to Sikorsky.

The Navy contracted for four HSS-1 prototypes in late June of 1952. The first flight of the XHSS-1 Seabat occurred on 8 March 1954. Orders had been placed for production aircraft before this flight, and the first production HSS-1 flew six months after the prototype. Squadron deliveries began in August of 1955, with HS-3 being the first to take delivery of the HSS-1. Within a year, there were nine ASW squadrons equipped with the HSS-1. Sikorsky produced 255 HSS-1s, including the prototypes.

The HSS-1 was originally produced with a stainless steel keel beam, but from the twenty-first example on, this was changed to aluminum; and the magnesium fittings of the lubricating system were also replaced with aluminum at this same time. The rod and link control system was replaced with a cable control system starting in 1957. The cockpit and cabin were fully equipped with removable soundproofing to overcome the difficulties experienced with the HSL-1. In addition to the pilot and co-pilot, seats were provided for one sonar operator and his relief. All equipment for the AN-AQS-4 and -5 sonar was carried in the cabin and a well for the dunking sonar head was fitted in the aluminum-structure floor.

Three fuel tanks were located under the cabin floor. These consisted of a five-cell forward bladder and two three-cell bladders, one center and one to the rear, none of these tanks were self-sealing. To allow greater range, the forward tank was enlarged from 100 to 155 gallons, while the other two remained at seventy and ninety-two gallons respectively. An auxiliary twenty-nine gallon tank could be mounted forward of the sonar gear. Engine oil capacity was twelve gallons, carried in two bladder cells, with dilution control but no shutoffs. A 25,000 BTU heater, half the size found in other military helicopters, was mounted above the radio equipment in the tail.

Because of the risk of a crash at sea, the HSS-1 was equipped with a signal pistol, cartridges, and a floatable smoke canister. While no provisions were made for emergency floats on U.S.Navy HSS-1s, foreign operators frequently equipped their aircraft with wheel-mounted inflatable floats. The aircraft was also equipped with a 600 pound capacity rescue hoist, although, unlike the other variants, it was not produced with the 5,000 pound capacity cargo sling, since this could interfere with sonar system.

There was no fire detection system and the only fire extinguisher carried was a hand-held CO2 bottle in the cabin. The electrical system included a 24-volt battery (with provisions for a 36-volt unit), a 400-amp transmission mounted generator and 250-volt and 1500-volt inverters. A 1,500 psi auxiliary servo system reservoir was mounted forward of the firewall. Cockpit warning lights were provided for the rotor brake and transmission oil temperature. Exterior lighting included port and starboard Red and Green lights, a White flashing canopy light, a 450-watt fully swiveling landing light in the left-hand nose door, and a large pylon-mounted motor-driven rotating Red flasher.

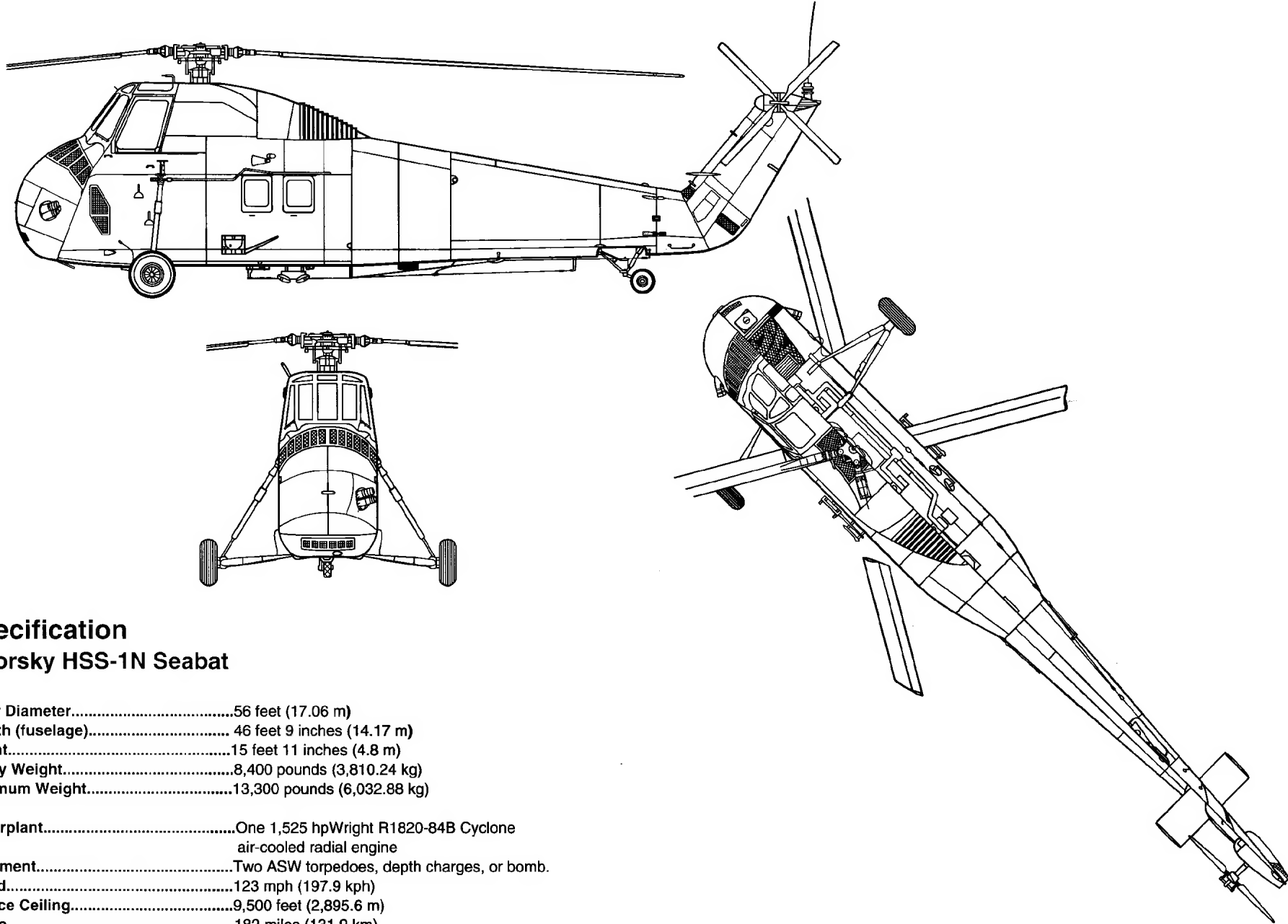
Standard radio equipment for Seabats included the AN/ARC-27A or -55 UHF



The Argentine Navy operated a single HSS-1 (C/N 611). The aircraft carried several serials including 2-HT-10, 2-PH-406 and 2-HT-21. It was in service from October of 1957 until it caught fire in April of 1961. The "donut" floats were a rare fitting on foreign HSS-1s, most users equipping their Seabats with wheel hub mounted floats

Operation PLUMBOB, conducted during 1957, tested the survivability of aircraft in flight during a nuclear explosion. This HSS-1 (BuNo 139024) was equipped with a variety of sensors for the project. Later, it served as a testbed for radar installations. (United Technologies)





Specification

Sikorsky HSS-1N Seabat

Rotor Diameter.....	56 feet (17.06 m)
Length (fuselage).....	46 feet 9 inches (14.17 m)
Height.....	15 feet 11 inches (4.8 m)
Empty Weight.....	8,400 pounds (3,810.24 kg)
Maximum Weight.....	13,300 pounds (6,032.88 kg)
Powerplant.....	One 1,525 hpWright R1820-84B Cyclone air-cooled radial engine
Armament.....	Two ASW torpedoes, depth charges, or bomb.
Speed.....	123 mph (197.9 kph)
Service Ceiling.....	9,500 feet (2,895.6 m)
Range.....	182 miles (131.9 km)
Crew.....	Four

transmitter/receivers, AN/ARC-2 or -2A HF transmitter/receivers, AN/ARA-25 UHF directional finding equipment group, AN/ARN-21 UHF radio navigation set, ADF-14B or AN/ARN-41A LF radio compass, and AN/AIC-4A interphone/radio control set.

By 1956, the Soviet Union had amassed the second largest Navy in the world, production of submarines had reached 100 per year and 450 were operational. In the event of war, these would pose a major threat to the shipping lifeline between North America and Western Europe. With memories of enemy submarine operations during the Second World War still fresh, a large portion of the Navy's budget and energy understandably went to ASW operations. The HSS-1 fulfilled its ASW role as part of a team. Attached to carriers such as the Atlantic Fleet's USS TARAWA and USS LEYTE, Seabats equipped as both hunters and sub-killers worked with destroyers and Grumman S2F Trackers to track submarines located by long-range Lockheed P2V Neptune patrol aircraft. The ability to come to a hover, stream a dunking sonar, directly follow changes in a sub's course, and carry out the attack with torpedoes was unique to the helicopter.

In service, the HSS-1 functioned as more than an ASW platform. Almost from the start, it was involved in rescue and flood relief operations. In one instance, an aircraft of HS-832 attached a line to a civilian aircraft downed at sea and towed it to shallow water. Even before it entered squadron service, it was being evaluated by NAMDDU for use as a mine sweeping sled tow. Seabats of HS-1 operated on the periphery of the abortive Bay of Pigs invasion during 1961. A HSS-1 recovered NASA's Aurora 7 in May of 1962. SH-34Gs were assigned to HT-8 at Elyson Field to provide training for Navy, Marine Corps and Coast Guard pilots, replacing the UH-19F in this role during 1963. A single HSS-1, fitted with instruments to measure gust, blast, thermal and radiation effects, participated in tests to determine the survivability of aircraft in flight during a nuclear explosion.

France's Aeronavale used twenty-five Sikorsky-built HSS-1s. In Algeria, Flotilles 31, 32 and 33 operated from Setif, Sidi Bel Abbes and Lartigue under the headquarters of GHAN 1. With the exception of French radio equipment, these aircraft were identical to American HSS-1s produced at the same time. The last were retired from GHAN 1 in a mass flight on 22 June 1979.

Italy purchased five HSS-1s for ASW operations between mid-1957 and early 1959 and these served with 50 Gruppo Ecoletteri. Japan's Maritime Self-Defense Force received eight HSS-1s between 1959 and 1962 and these aircraft served until late 1972. The Argentine Navy operated one Seabat, which was lost in an accident during 1961.

Sud Est

With demands on Sikorsky's production high, Sud Est of France was contracted to license-build HSS-1s to keep pace with the needs of the French Navy. The forty-nine Sud Est-built aircraft (which might include the twelve component aircraft delivered by Sikorsky for assembly in France) were stock HSS-1s, except for French radios and metric fittings. French-built aircraft carried their type and Sud Est construction number on the tail rotor pylon, while those purchased from Sikorsky either carried no serial or showed the manufacturer's number on the tail boom.

Five of the Sud Est HSS-1s went to the Belgian Air Force, where they were serialized B4 through B8. The last of these was retired on 19 July 1986.



Some HSS-1s were used as testbeds. In addition to nuclear and radar tests, this HSS-1 (BuNo 139024) served with NAMDDU undergoing tests to determine if helicopters could be used to tow minesweeping sleds. (Navy/National Archives)

Italy's first HSS-1 was assigned to One Gruppo Ecoletteri. The aircraft was overall Engine Gray and carried the serial MM.80163 and side code 4-01 when operational. Nearly all of Italy's Seabats were destroyed by a tornado in October of 1964. (United Technologies)

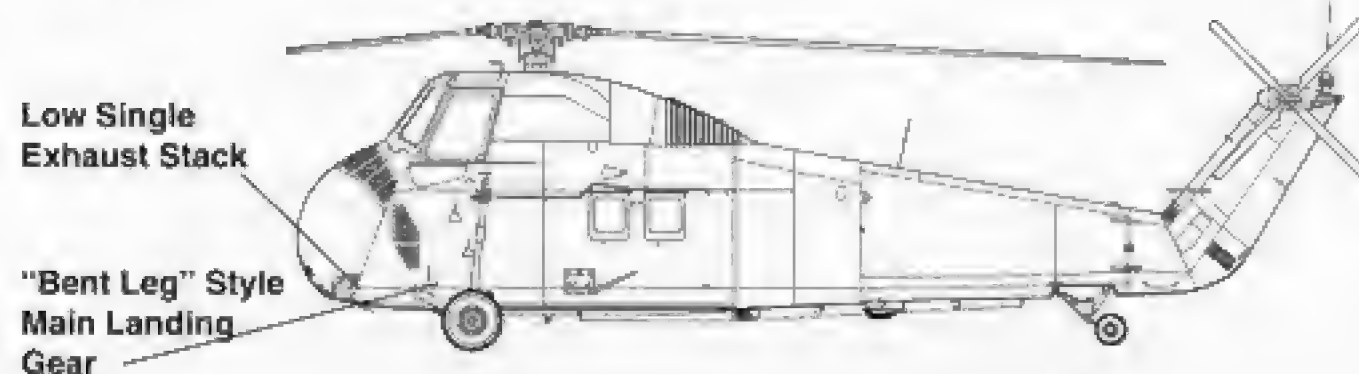




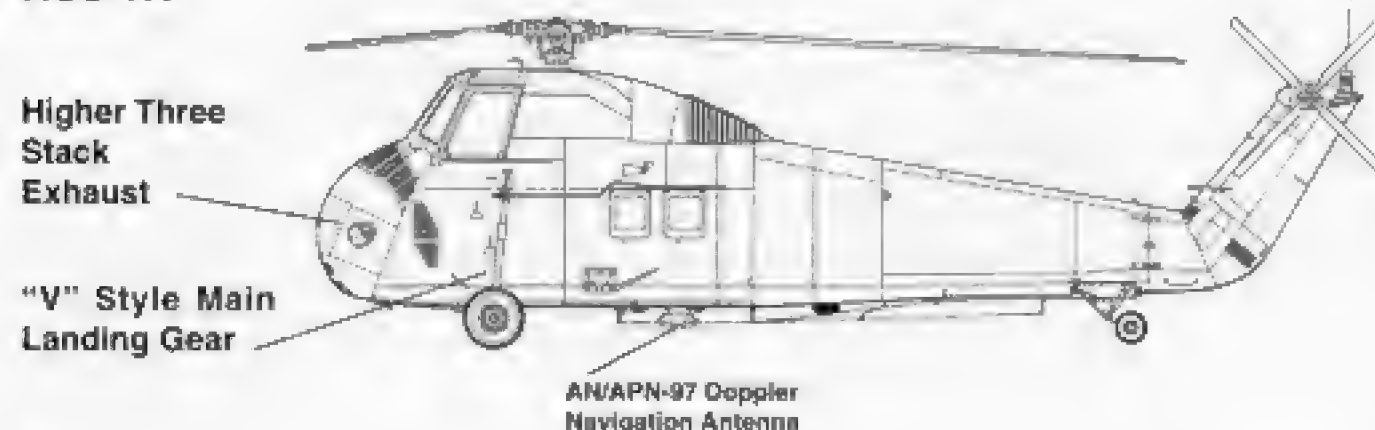
Sud-Est-built Seabats retained their HSS-1 designation even after U.S. and most others had been changed to the SH-34G designation. Even when stripped of their ASW gear and used in the utility role, (UH-34G) the Belgian Luchtmaacht continued to refer to their Seabats as HSS-1s. This Belgian aircraft was lost in a crash on 29 August 1985. (via Dana Bell)

Fuselage Development

HSS-1

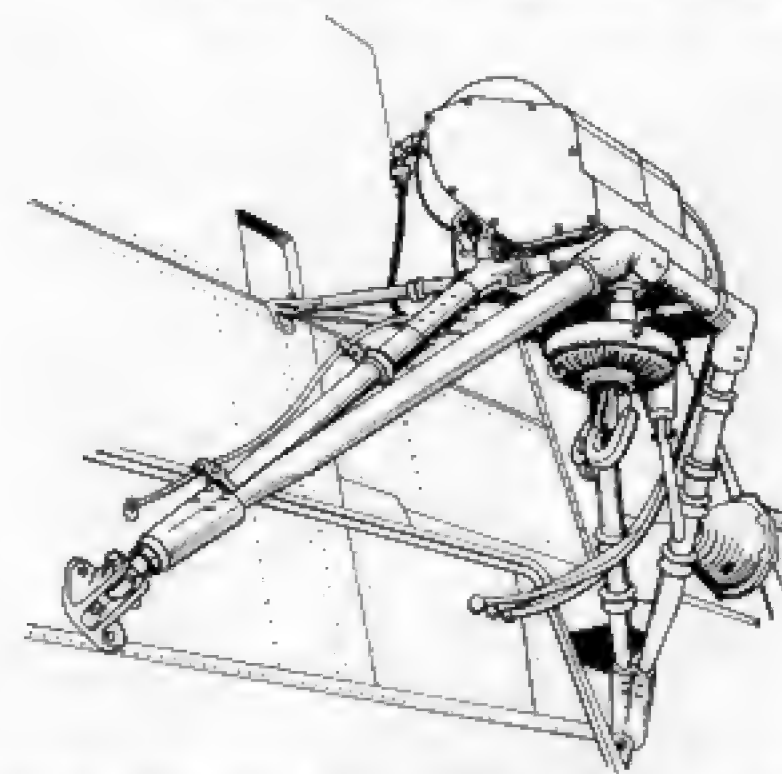


HSS-1N



Engaged in a ground war in Algeria, the French tested a variety of weapons on its Seabats. This Sud-Est-built aircraft carries external long range fuel tanks on the starboard fuselage side along with a SS-10 anti-tank missile. (SHAA).

600 Pound Rescue Hoist



The aircraft was also fitted with a SS-10 and six five inch HVAR rockets on the port side. The use of the missiles required modification of the low stack exhaust and flame guards over the main landing gear. (SHAA)



HSS-1F/SH-34H

The performance and reliability of turbines had already been recognized in the mid-1950s. One HSS-1 (BuNo 141601) became the HSS-1F. The Wright R1820-84 radial air-cooled engine was replaced by a pair of General Electric YT58 turbine engines installed on a shelf behind redesigned nose doors. Experiments with this aircraft by the Navy and Sikorsky were instrumental in developing the HSS-2 as well as conversions under the S-58T designation. The HSS-1F served as a testbed for the T58 engine and was redesignated the SH-34H during 1962.

Wessex

As part of their strategy of building the designs of other companies under license, Westland Aircraft accepted a single HSS-1 in May of 1956. Taken from the production line directly after the HSS-1F, this was the last airframe in a U.S. Navy order for thirty-two aircraft. Its BuNo, 141602, was reassigned to an aircraft delivered to the Navy during early 1957. Carrying test registration G17-1, the Wessex prototype was delivered with a standard R1820-84 engine but re-engined by Westland with a Napier Gazelle Na G. 11 turbine of 1,250 shp. In Royal Navy service, it was serialed XL722, and served as a testbed following its first flight on 17 May 1957.

The Wessex was the only turbine-powered version of the H-34 to see production. Nearly 400 were built, covering eleven military and civil variants, with deliveries beginning in April of 1960.

VH-34G

As part of the joint service responsibility for Presidential helicopters, a few SH-34Gs were built with emergency floats and executive interiors in place of their standard ASW gear. These VH-34Gs served along side Army VH-34As and Marine Corps VH-34Ds until being replaced by "plushed" VH-3s.

HSS-1N/SH-34J

Just as advances and demands in ASW led from the H04S-1 to the HSS-1, advances in ASW tactics quickly led to changes in the HSS-1. To allow true all-weather, around-the-clock ASW helicopter operations for the first time, an automatic hover coupler, Sikorsky-designed automatic stabilization equipment (ASE) and a Ryan AN/APN-97 Doppler navigation unit were added to create the HSS-1N. The R1820-S4B with engine governor was the standard power plant for this model. The HSS-1N also differed from its predecessor in having two 300-amp generators (one on the engine and one on the transmission), two 1500-volt inverters forward and one 100-volt aft and a transmission oil temperature indicator.

The first public flight of the HSS-1N, of which 256 were produced, took place at NAS Corpus Christi on 26 May 1958. The first unit equipped with the N model was HS-4, which pioneered many of the procedures and tactics for night-dipping operations, and the rest of the Navy's ASW units quickly followed suit. The last Navy Seabat was accepted in April of 1966.

Carrying homing torpedoes (either active or passive) or conventional depth charges and with



The Wessex prototype was a stock U.S. Navy HSS-1 Seabat with the early style main landing gear configuration. (Westland)

Westland modified the HSS-1 with a Napier Gazelle Na.G.11 turbine engine, making only limited changes to the nose. An observers bubble window was also added to the main cabin. (Westland)



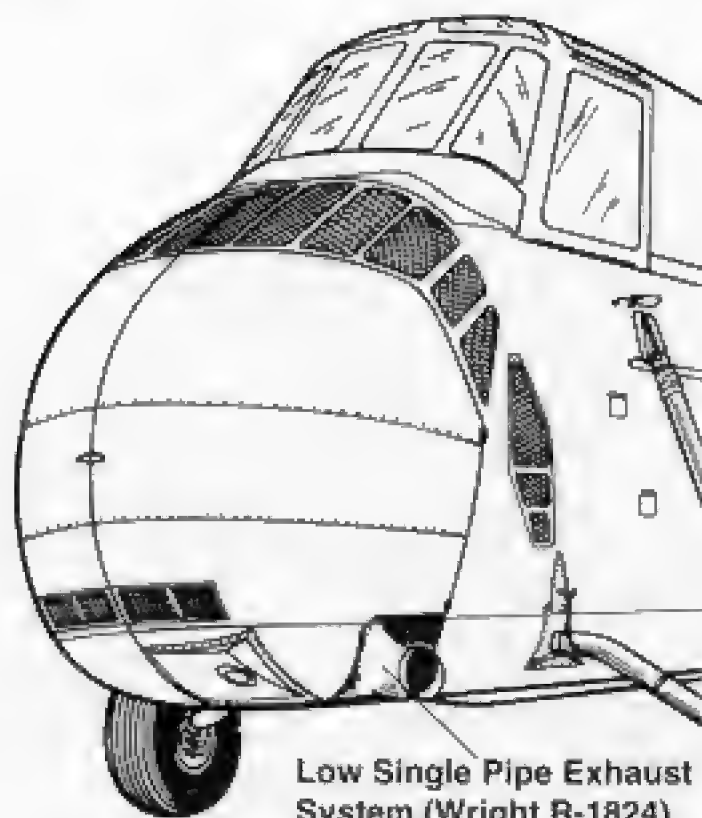


The nose of the Wessex HU.5 has little resemblance to the HSS-1 from which it was developed. Its twin turbine power plant consists of a pair of 1,320 shp Rolls-Royce/Bristol Siddeley Gnome turbines limited to 775 shp each. Westland never adopted the V style landing gear for its helicopters. (Leon Wohler)

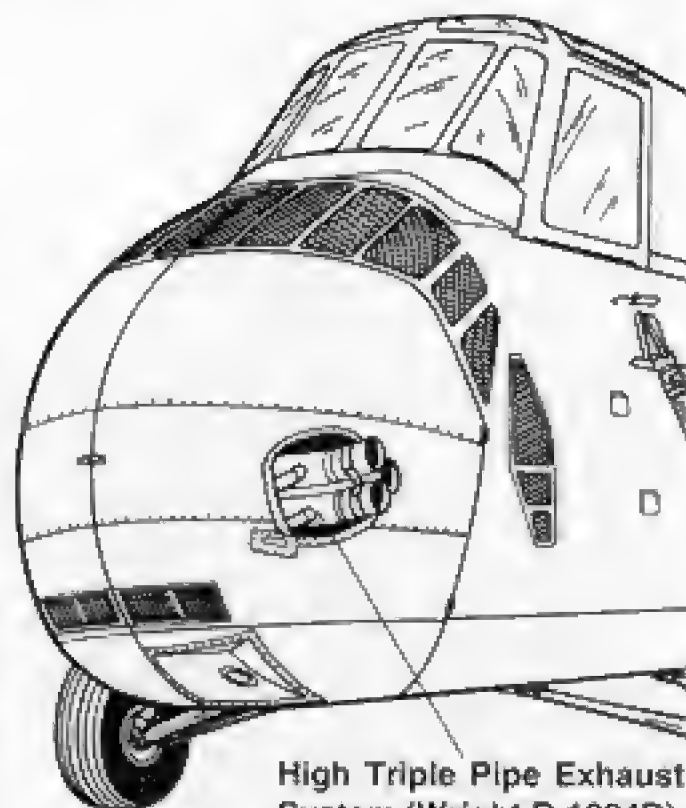
Engine Exhausts

HSS-1

HSS-1N



Low Single Pipe Exhaust System (Wright R-1824)

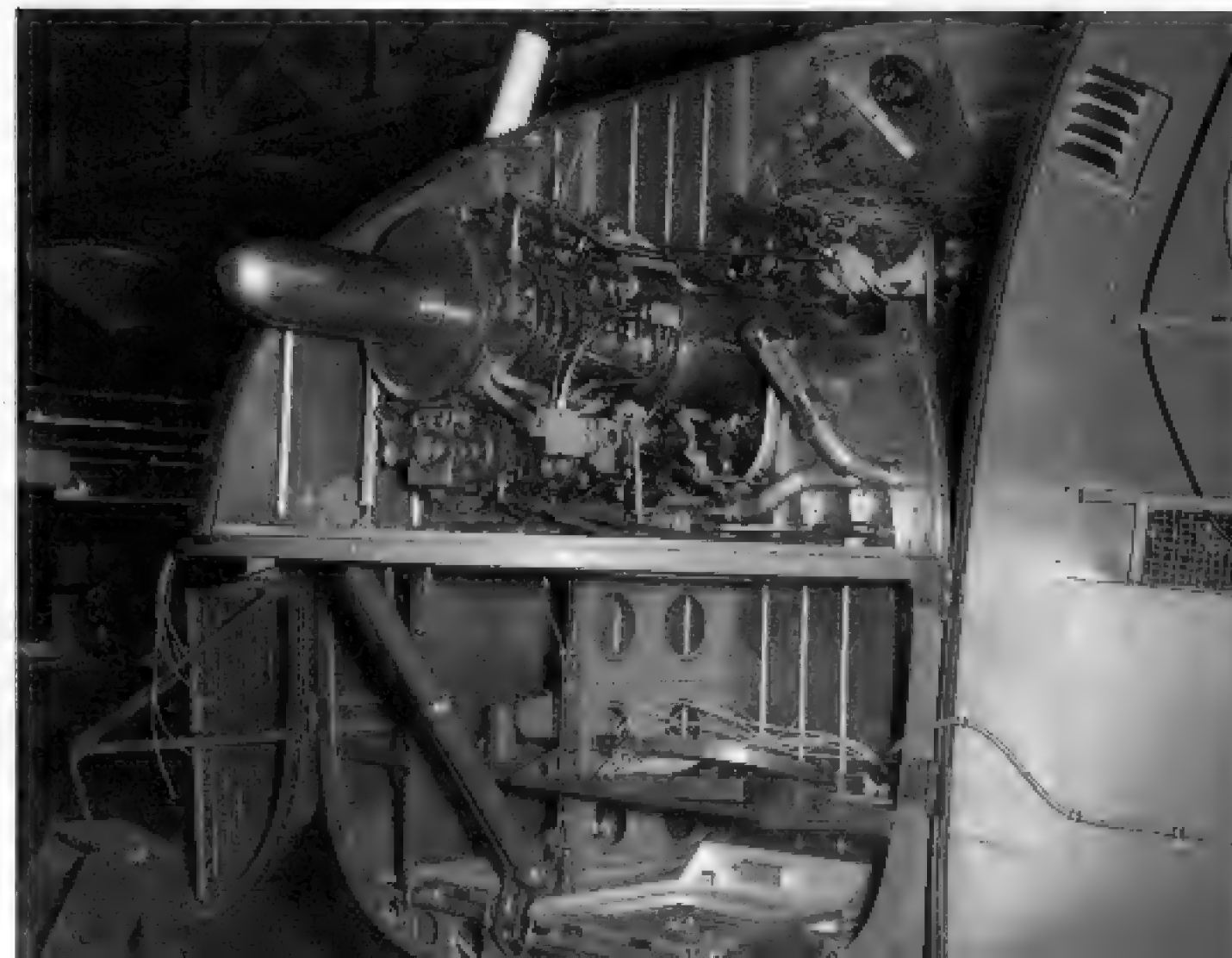


High Triple Pipe Exhaust System (Wright R-1824B)



This was the sole example of the HSS-1F (BuNo 141601) undergoing tests at Bridgeport during early 1958. The Cyclone radial engine was replaced by two YT58 turbines in a lengthened and reconfigured nose. The aircraft was painted overall Light Gull Gray and carried no markings. (Sikorsky Aircraft)

The YT58 turbine engines were mounted high in the nose of the HSS-1F prototype. The lower two shelves mounted in the modified nose section housed engine controls and monitoring equipment. (United Technologies)



the ability to deliver atomic depth bombs, the around-the-clock ASW provided by the HSS-1N made it a formidable weapon in the Fleet's inventory. The automatic night approach and dipping control equipment was not without its flaws, however, and was used cautiously during night operations. Before Marine squadrons with HUS-1s entered the arena, Pacific-based ASW units were used to move troops into the jungles of Vietnam, where their radar altimeters were of great value.

During HSS-1N production, the main gear was modified. The original two-leg gear was replaced with a wider-tracked three-leg gear in an effort to minimize problems with ground resonance and gear failure. This change, which began with BuNo 147984, remained in effect for the rest of the production run, but was not retro-fitted to existing aircraft. Also introduced as standard at this time was the three-barrel hi-stack exhaust with flame dampers.

The Navy converted at least 107 HSS-1s to -1N standards under Aircraft Service Change 84. Chile ordered three HSS-1Ns, eventually receiving and operating two in the ASW role; these were shore-based, as there were no vessels in the Chilean Navy large enough for Seabats. The Uruguayan Navy received two SH-34Js, which crashed within months of being taken on strength. Mitsubishi assembled Sikorsky-produced HSS-1Ns for the Japanese Maritime Self-Defense Force. Italy added twelve of the all-weather Seabats to its naval inventory. The Dutch Navy purchased eleven SH-34Js, which were converted to utility standards once they became obsolete in the ASW role. Haiti operated three Seabats after they were retired from the American Navy. Six HSS-1Ns were transferred to the U.S. Air Force for sale to the Brazilian Air Force, where they operated from 1961 to 1965; these were subsequently transferred to the Brazilian Navy, serving from 1965 to 1975.

H-34G.III

The H-34G.III, as the Germans designated their HSS-1Ns, covered two types. Eighteen HSS-1Ns were delivered directly to the German Navy for ASW duties as the H-34G.III Marine. Another fifty-two HSS-1Ns were produced to CH-34C standards, reflecting the elimination of ASW equipment, as H-34G.III. These were delivered to the Bundeswehr before eventual transfer to naval use. All seventy German Seabats were produced and delivered between 1962 and 1965. All German aircraft, including those based on the H-34A, were powered by the Wright 989C9HE series engine, which was the civilian equivalent of the R1820-84

Additionally, twenty-four of these hybrid aircraft went to the Israeli Air Force under cover of sale to Germany. These saw service as troop and cargo transports, and in the medevac role, until being retired in 1968. The bulk are believed to have survived, returned to America, and were converted to turbine propulsion.

UH-34G and UH-34J

With the Seabat being replaced by the SH-3, airframes with a long service life remaining were stripped of their ASW gear and reconfigured for utility use as the UH-34G and UH-34J. This change also applied to aircraft operated by foreign services, and aircraft of this type were delivered to the VNAF.

In the utility role, Seabats functioned as VIP transports, provided vertrep capabilities, and acted as station hacks. While operating as part of VU-8 from NAS Roosevelt Roads, stripped Seabats were tasked with the recovery of Ryan Q2C Firebee drones used in live-fire missile



This HSS-1N carries the belly mounted AN/APN-97 Doppler navigation antenna which was one of the primary identification features of the HSS-1N. Later this aircraft was stripped of its ASW gear and redesignated as a UH-34J, serving at NAS Willow Grove, PA with the Naval Reserve. (United Technologies)

exercises by the Atlantic Fleet. External 150-gallon ferry tanks were frequently required for such missions.

HH-34J

Fourteen SH-34Js went to the Air Force from Navy storage, and were assigned briefly to Reserve units for SAR work as HH-34Js. These were equipped comparably to the UH-34J, the only obvious difference being the addition of a loudspeaker to the port main landing gear strut.

This HSS-1N was assigned to Anti-Submarine Helicopter Squadron Seven (HS-7) aboard the USS RANDOLPH during July of 1961. (Navy via Rodney L. Earl)





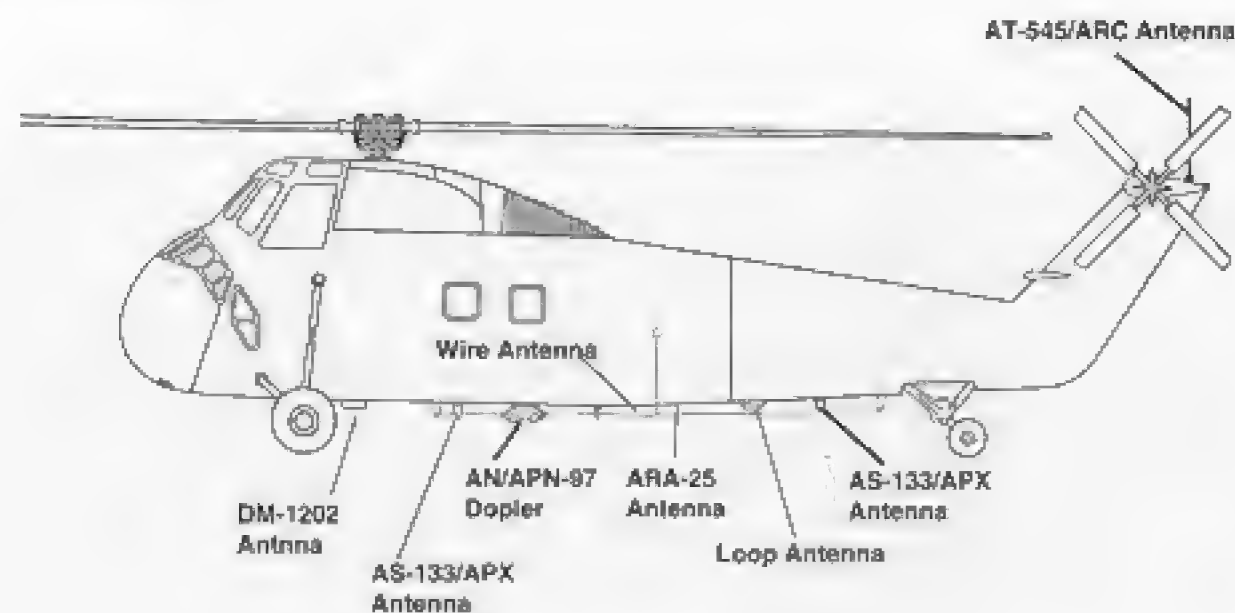
LT(JG) Don Alberts readies his HSS-1N (BuNo 148003) of HS-4 for launch from USS YORKTOWN (CVS-10) during October of 1961. Compact stowage of the Seabat was a necessity aboard carriers and the folding main rotors were a big asset. The blades were painted Black on the undersurfaces and Light Gray on the uppersurfaces, making it very apparent if maintenance personnel installed a blade upside down. (Don Alberts)



Seabats filled many roles, even when deployed as part of an ASW task force. This HSS-1N (BuNo 148021) of HS-4 delivers mail sacks to the USS POMFRET during early 1962. The weapons racks on this Seabat have been removed, although the sonar is still in place indicating that this is still an active ASW aircraft. (Don Albert)

Seabat Antenna Configuration

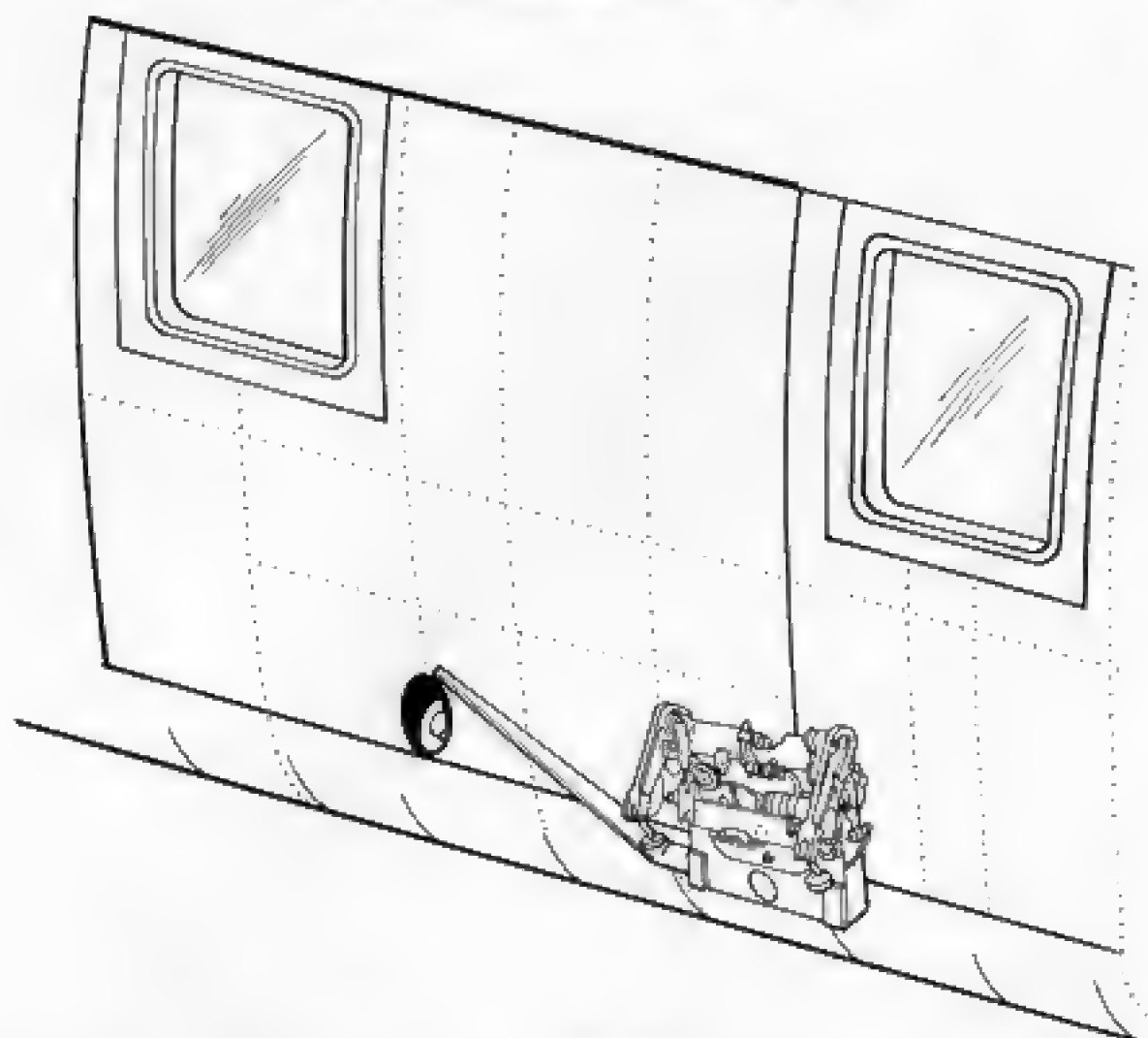
HSS-1/HSS-1N



A Seabat of HS-4 on final approach for landing aboard USS PRINCETON (CVS-37). The aircraft was overall Gloss Sea Blue with all lettering in White. (Rodney L. Earl).



Torpedo Launcher Pylon



Like its American counterparts, Chile's HSS-1Ns were painted in overall Gloss Engine Gray (FS 16081) with Semi-gloss Fluorescent Red-Orange (FS 28913) tailboom and engine cover doors. The aircraft was fitted with cannister floats on the main wheel hubs, which were typical of foreign Seabats. This is a late production aircraft with high exhausts and V style landing gear. (Museo Nacional de Aeronautica de Chile)



Japan operated both the HSS-1 and HSS-1N variants of the Seabat. The JMSDF solved a potential supply problem by using only the early R1820-84 engine with the low stack system for all its variants. This HSS-1N was assembled by Mitsubishi after being shipped to Japan as a knocked down kit. It served from early 1963 until late 1973. (JMSDF)

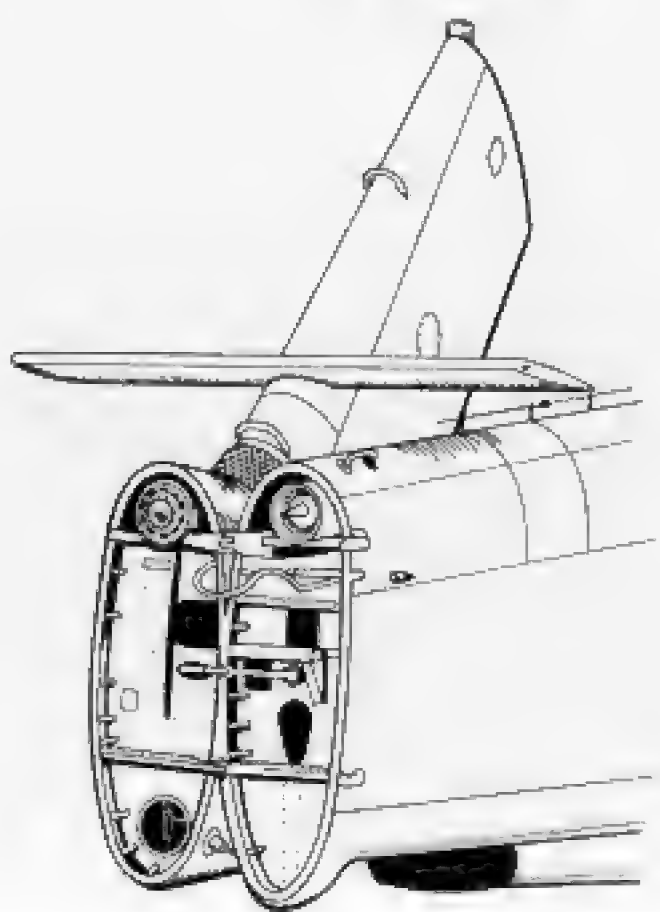
VSQ-8 operated from the Dutch carrier HMS KAREL DOORMAN. Carrying serial 134, this HSS-1N was built as BuNo 147625 and crashed off Gibraltar on 31 January 1963. (Koninklijke Marine via Dana Bell)



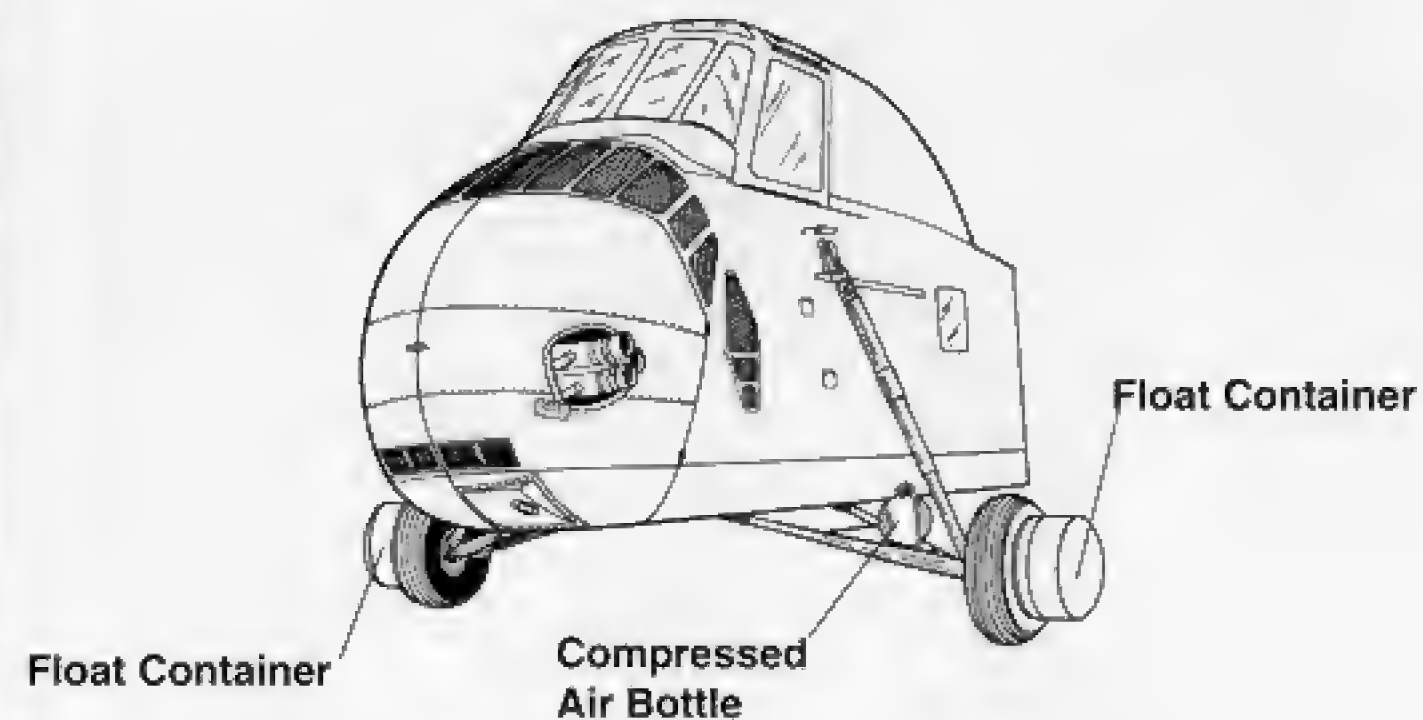


Aircrews depart a Seabat of HS-4 aboard USS PRINCETON (CVS-37). The aircraft has been tied down to the flight deck with tie-down chains and the main landing gear is chocked. The tail rotor warning panel is Yellow with Red lettering. The small fairings above the tail wheel are the hinge points for the folding tail. (Rodney L. Earl)

Tail Fold



Canister Floats



H-34s equipped with canister floats had no tail wheel float. This Italian Navy H-34J, coded 4-09 (BuNo 153617) was recovered thanks to the floats, but it was still written off after this accident in November of 1969. The cause of the crash was tail rotor failure. (Stato Maggiore Marina)





West Germany operated both H-34G.III (hybrid HSS-1N/CH-34C) and H-34G.III Marine (SH-34J) aircraft. The aircraft were painted overall Forest Green. This H-34G.III 80+58 (BuNo 150742) carries nose-mounted FM radio homing antennas which were typical of German H-34s. After leaving military service, it was converted to turbine power and operated by Greenlandair and Island Helicopters. (Leon Wohler)

Called S-58s by the Israeli Air Force, these aircraft were hybrids diverted from West German shipments. Smoke grenades on the starboard main strut were common, while the absence of the nose mounted FM radio homing antennae was not. (Israeli Air Force, via Dana Bell)



This H-34G.III Marine WE+554 (BuNo 150811) has the compressed air bottles for canister floats, but no floats. MFG5 aircraft were often painted Aluminum (RAL9007) with a Leuchtorange (RAL2005) nose, transmission housing, fuselage band and tail pylon band. The SAR logo is in Light Blue. (MAP)

Israeli Air Force S-58s were camouflaged with Light Olive Drab swatches painted over the original Field Green color scheme (without obscuring the English-language stenciling). The tail rotor blades had Red/White/Red tips. (Israeli Air Force, via Dana Bell)





This Vietnamese Air Force (VNAF) UH-34G (138464) survived the war in Southeast Asia, but ended up stripped for parts in Arizona. Vietnamese H-34s, often operated without main cabin doors, carried Marine Corps style twelve seat troop interiors. (Timothy Kerr)

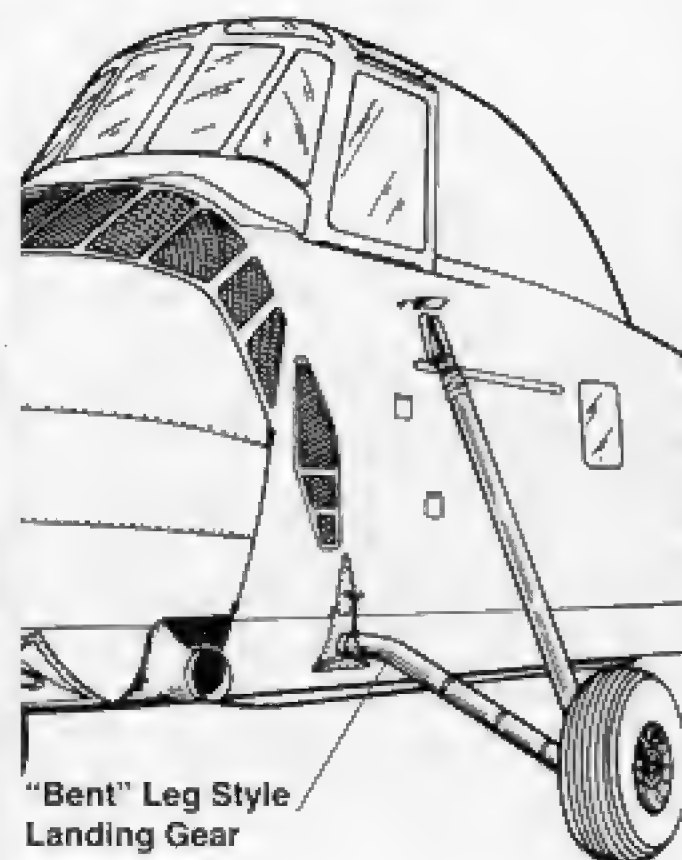
Like many Seabats BuNo 143904 had a number of different designations and operators. Built in 1957 as a HSS-1, it was upgraded to a HSS-1N. Stripped of its ASW gear, it became HT-8's UH-34G 118 before going to storage at Davis-Monthan and then to the VNAF. The overall Fluorescent Red Orange scheme was standard for training helicopters. (Leon Wohler)



The original R1820-84 radial engine has been replaced with a hi-stack -84B engine to ease maintenance logistics, an ongoing problem with all VNAF H-34s. This UH-34G (141575) is unusual in that it has not had nose armor installed, which was common by late 1967. The aircraft was operating from Tan Son Nhut Air Base. (USAF via Jim Mesko)

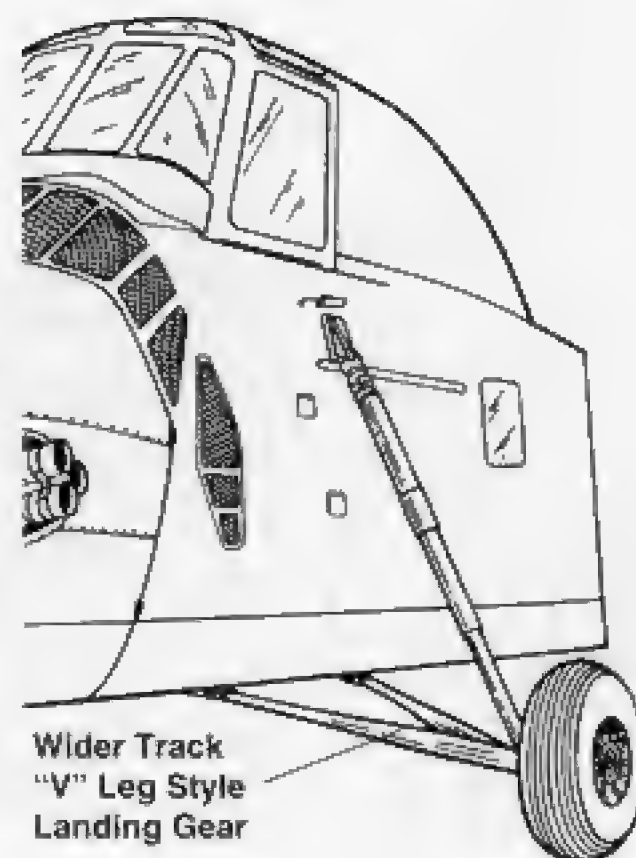
Main Landing Gear

HSS-1



"Bent" Leg Style
Landing Gear

HSS-1N

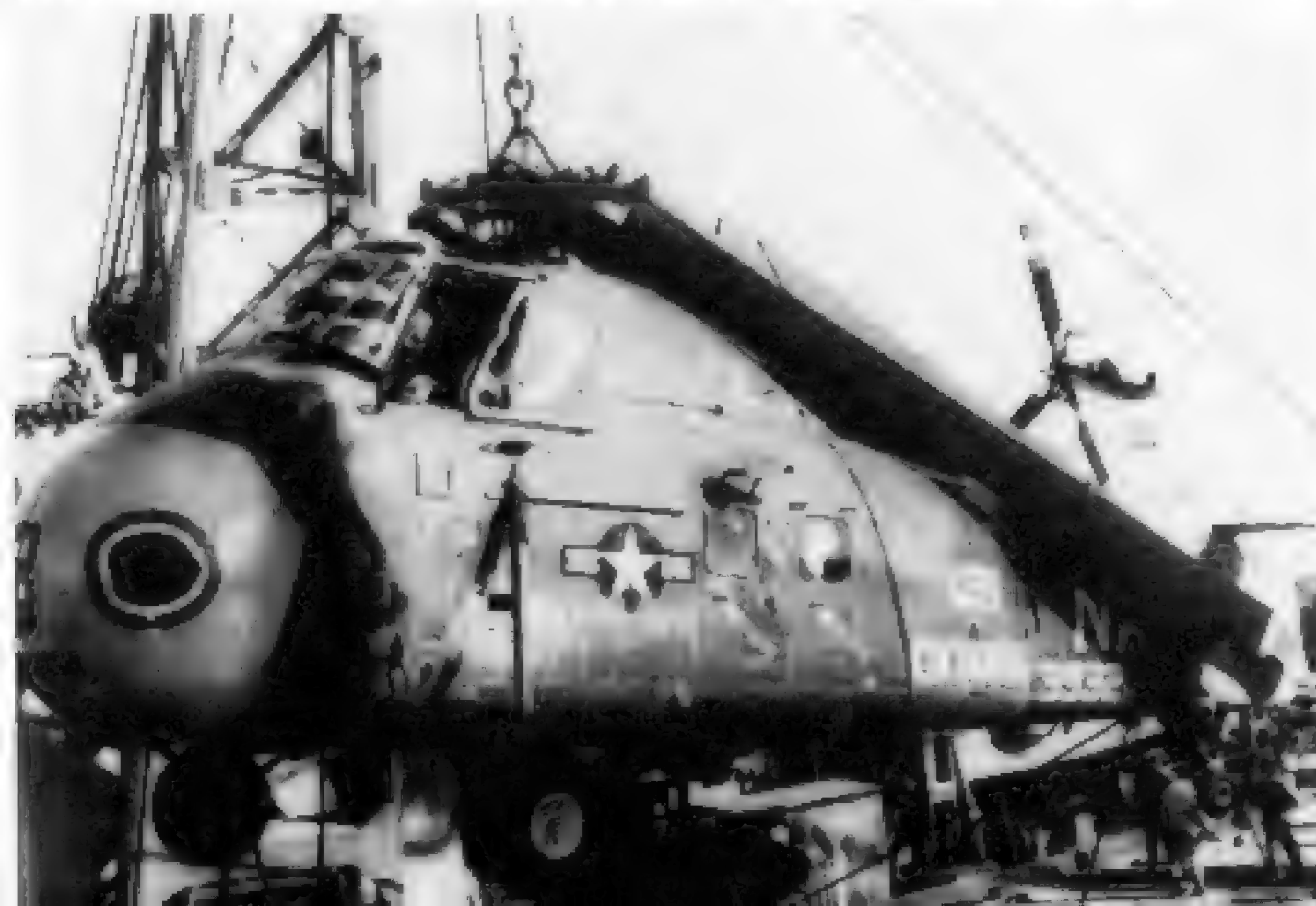


Wider Track
"V" Leg Style
Landing Gear



The Dutch Navy converted its HSS-1Ns to UH-34Js when they were no longer needed for ASW duties. Externally, the change was distinguished by the absence of the Doppler navigation antenna heads on the belly. UH-34J 142 (BuNo 147632) was painted Engine Gray on the uppersurfaces with a Sky fuselage. This scheme was common to Dutch Seabats. Plans to lengthen their service life by conversion to S-58T standards was not followed through. (Koninklijke Marine)

USS OKINAWA operated this UH-34J in the mid-1960s. The Engine Gray and Red Orange scheme indicates that at one time it was used in the ASW role. The frame below the co-pilot's seat could hold an Admiral's placard for VIP flights. (National Archives)



Almost all HH-34Js were late-production aircraft built with R1820-84B hi-stack engines. The aircraft in the foreground, 45710 (BuNo 145710), was one of the exceptions. Both the engine and the original port access door have been upgraded to -84B standards. These 30th ARRS aircraft visited Hamilton AFB in June of 1972. (USAF via Dana Bell)

This overall Light Gray (FS 36440) Air Rescue Service aircraft was operated from Florida. Loudspeakers and UH-34D style main landing gear lights were standard features on HH-34Js. 48963 (BuNo 148963) was originally a HSS-1N. Restored by the Air Force Museum, it is on display at Warner-Robins AFB's Museum of Aviation. (Carl Lundh)



H-34A/CH-34A Choctaw

Operations in Korea had proved the worth of the helicopter in combat. Troops, weapons and supplies could be moved with a speed unmatched by trucks. Often, landing zones were in areas inaccessible to wheeled transport and obtainable by foot only with long delays and extreme effort. The evacuation of casualties from the front line was also brought to a new level. At the same time, one of the lessons of the Asian war was that helicopters needed to be larger and more powerful. Like most tools, their successful use led to larger and more difficult applications.

Requirements were let for a helicopter to fill the gap between light aircraft, such as the Bell H-13 Sioux, and the envisioned heavy Sikorsky H-37. Piasecki put forth the H-21 and Sikorsky the H-34. In a separate competition, the Air Force chose the H-21 to meet its needs. Because Air Force orders for the H-21 had taken all of Piasecki's production capacity, an Army contract was awarded to Sikorsky for the H-34 Choctaw.

All Choctaws produced for the Army were H-34As and between 1954 and 1959, a total of 434 were taken on strength. Additionally, twenty-three UH-34Ds were transferred as H-34As from the Marines. Like the Seabat, the Choctaw was fitted with a titanium fire wall, an auxiliary hydraulic pump on top of the engine, a small steel tube step below the cabin door, and a radio compartment between stations 246 and 296.

There were also numerous differences. With shorter, overland flights anticipated, a carburetor air filter, reduced oil capacity, and 100 gallon self-sealing forward fuel cells were standard while pyrotechnics and cabin soundproofing were deleted. A liquid fire extinguisher was carried, and a fire detection sensor was placed in the engine compartment. The electrical system, which could not be upgraded to 36-volts, included a 200-amp generator and two 250-volt inverters. The flashing tail light was changed from Red to Yellow.

Heavy spar rotor blades were introduced on the H-34A in October of 1956, and became standard on other models the following January. The 600 pound capacity rescue hoist was mounted on the H-34A beginning with serial 53-4502, and the starboard workstand then contained a spring-hinged panel that allowed it to open around the hoist. Shortly after production commenced, Army H-34As were equipped with an external 5,000 pound capacity cargo sling. A window in the floor, protected on the inside by a sliding cover, allowed the crew chief to help direct the pilot when lowering cargo.

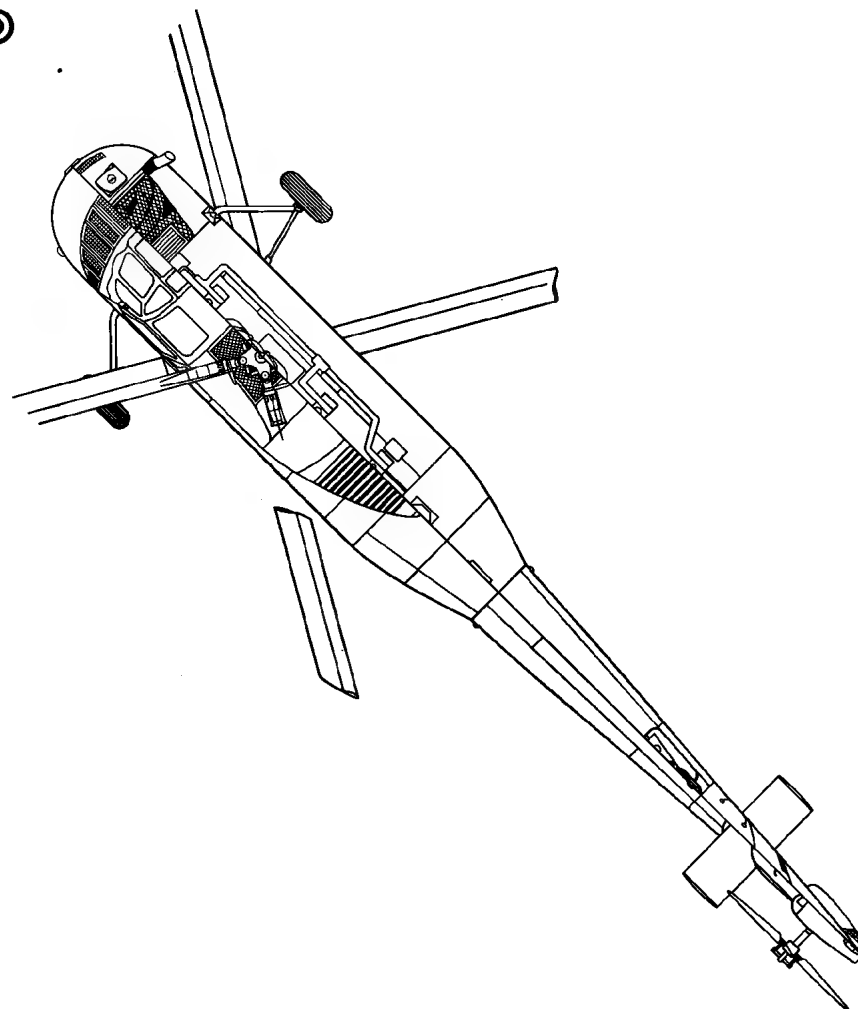
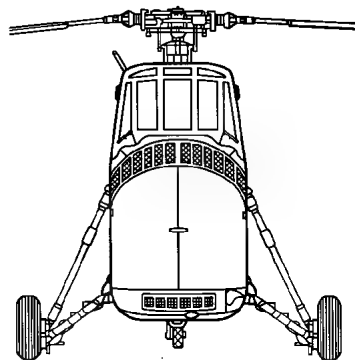
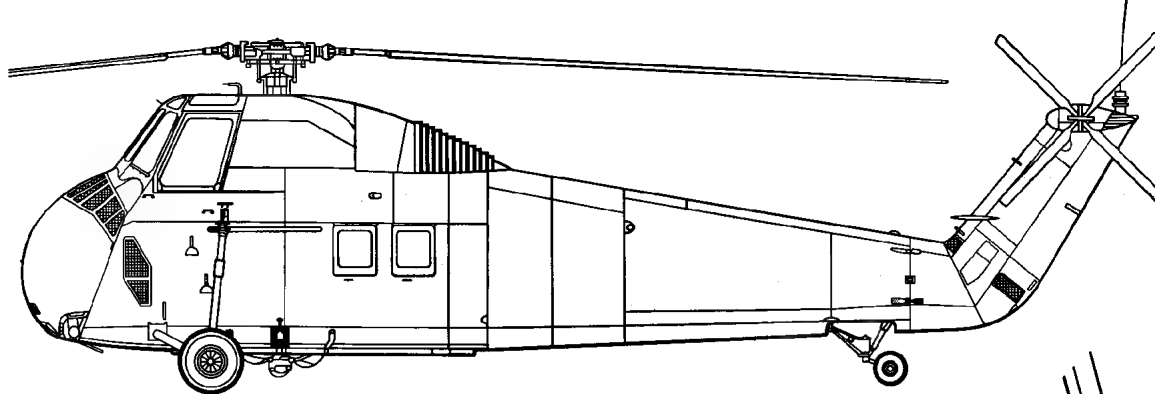
Choctaw radio suites included the AN/ARC-55 UHF and AN/ARN-6 VHF transmitter/receiver sets, AN/ARN-59 radio compass, AN/ARN-30A Omni, ARC Type 12 interphone, AN/ARA-31 FM homing, and AN/ARC-44 FM liaison set.

Choctaws saw wide use as troop and cargo carriers, medevac aircraft, and armament test beds. As part of the move towards an independent Army troop movement capability, separate from control by the Air Force, the need for armed helicopters to fight into and protect landing zones was envisioned and acted upon. Most trials centered around machine gun and rocket installations, which later led to the Hueys and Huey Cobras of the Vietnam War.

The only combat use of American Choctaws came during the Lebanese action in 1958.

Troops board a H-34A during field exercises. The Gloss Olive Drab (FS 14087) Choctaw (54-895) has the flat cockpit side windows typical of early Choctaws, but has not had the rescue hoist fitted. (Army Transportation Museum)





Specification

Sikorsky H-34A Choctaw

Rotor Diameter.....	56 feet (17.06 m)
Length (fuselage).....	46 feet 8 inches (14.17 m)
Height.....	15 feet 11 inches (4.8 m)
Empty Weight.....	7,675 pounds (3,481.38 kg)
Maximum Weight.....	13,300 pounds (6,032.88 kg)
Powerplant.....	One 1,525 hp Wright R1820-84 Cyclone air-cooled radial engine
Armament.....	None.
Speed.....	107 mph (172.19 kph)
Service Ceiling.....	9,500 feet (2,895.6 m)
Range.....	318 miles (511.75 km)
Crew.....	Three



The large clamshell doors and an angle mount greatly eased access to the H-34's R1820-24 series power plant. The engine controls are the later cable style. (United Technologies)

This Choctaw (58-755) was assembled from components by Sud Est, becoming SA.33. Heavily armed H-34s were common in Algeria. This one carries a .50 caliber machine gun on both sides, as well as a swivel-mounted 20mm cannon in the cabin door. (SHAA via Albert Grandolini)



As part of the late 1961 Armored Cavalry Regiment experiments, this H-34A (54-3045) was fitted with a .50-caliber machine gun and twelve 4.5 inch rockets on both sides of the fuselage. While armed Choctaws did not see combat, such experiments helped speed the development of weapons systems used on the UH-1 Huey in Vietnam. (Army Aviation Museum)

Hanging an enclosed gun mount, including gunner, from the starboard side probably did not improve the flight characteristics of this French H-34A. The undernose armor plate suggests this aircraft saw service in Algeria. (SHAA)



While available for use in Vietnam, the bulk of Army H-34s were in Europe, while the H-21 Shawnee, which the Army had finally received, was already in the Pacific. The Vietnamese Air Force (VNAF) did operate the H-34 in combat; their seven squadrons were equipped with a mix including CH-34As and CH-34Cs. The Royal Canadian Air Force purchased six early-production H-34As; along with transport and SAR duties, the RCAF Choctaws were instrumental in building the Mid-Canada Line, a string of early warning posts which formed the second line of radar defense during the Cold War. The Uruguayan Navy operated four ex-U.S. Army CH-34As over a twenty year period, three eventually ending up as spares for the surviving example. Nicaraguan H-34As were equipped with racks for light bombs during the first civil war. Haiti and China also used H-34As, and Israel purchased two.

Pleased with the success of the H-19 in Indochina and Algeria, the French Air Force purchased 117 H-34As. Of these, seventy-nine were shipped complete, the remainder going in knocked-down form for assembly upon receipt. Except for French radios, these were identical to U.S. Army H-34As, and changes to the American H-34As were reflected in the French machines.

While the American Army struggled with the Air Force over role definition, no such concerns interfered with the French conflict in Algeria. Armée de l'Air H-34As were armed almost from the start, their machine gun and rocket installations providing the impetus for American experiments. Even 20MM cannon were used against the rebels. Mimicking American events, there was a deep rivalry between proponents of the H-21 and the H-34. The ADA operated the H-34, the Army took the H-21, and the Aeronavale settled the matter to their satisfaction by using both.

Sud Est

Along with the HSS-1, Sud Est contracted to produce the H-34A. Under this agreement, 136 were built for the Armée de l'Air (this number might include the thirty-eight component airframes shipped from Sikorsky). These were identical to American Choctaws except for radios and metric fittings. The only external difference lies in serial numbers. Purchased aircraft were serialised "58-", followed by the construction number, while license-built aircraft were marked "SA.", followed by the Sud Est number.

French H-34As operated almost exclusively in Algeria. The units involved were GMH57, EH1, EH2 (later 22EH), and EH3 (which became 23EH). Operating from Boufarik, Oran, and Reghaia, they provided experience which should have influenced American operations in Vietnam. The need for armed helicopters was proven on a daily basis. Also acted upon by the French was the need to provide armor protection for the exposed underside of the engine and oil cooler. Unfortunately, it was necessary for the Marines to relearn these lessons from hard experience during Operation SHU FLY in the early 1960s.

Turbomeca equipped two Sud Est H-34As with twin Bastan turbine engines. Like the HSS-1F, the Bi-Bastan was influential on future helicopter development but did not see production.

(Left) A Canadian H-34A (9632) brings supplies for the Mid-Canada Radar Warning Line. The aircraft was painted Red 9-2 uppersurfaces and Blue 2-12 lower surfaces with White trim. The fuselage band is Dayglo with Blue outer bands. (Canadian Forces Photo Unit)



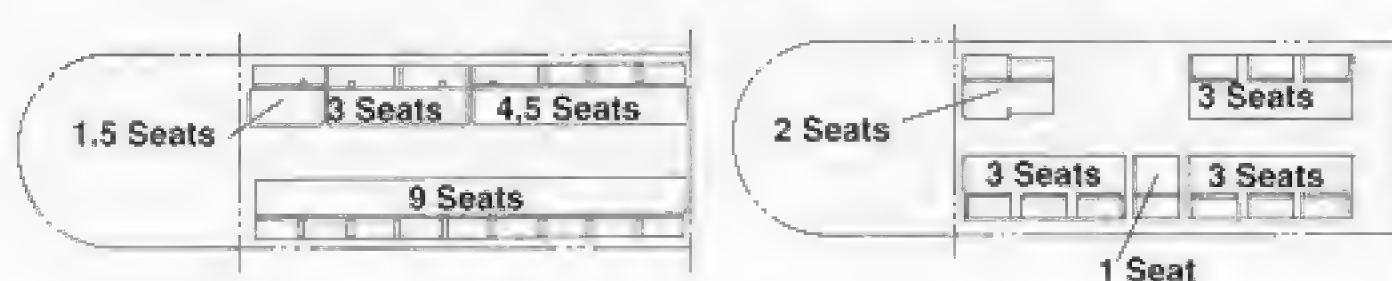
While the magnesium skin burned easily, not all Choctaw crashes destroyed the aircraft. This aircraft (54-900) was repaired and eventually stored at Davis-Monthan. (Army Aviation Museum)





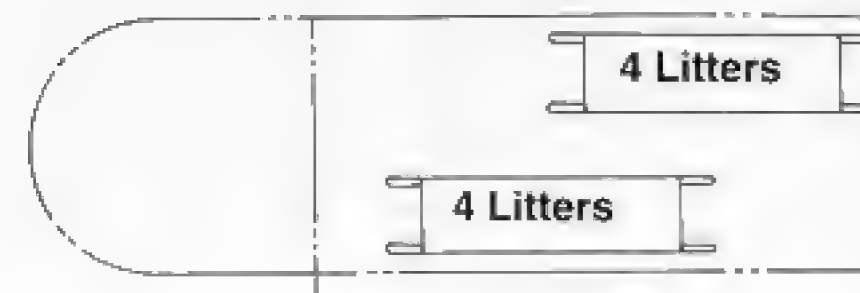
An H-34 40891 (54-891) of the 213th Helicopter Squadron, VNAF, retains the early flat side cockpit windows. Stripped of its rescue hoist and fitted with hi-stack exhaust, under-nose armor, and a door-mounted .30 caliber machine gun, it is clearly a Vietnam War combat aircraft. (USAF via Jim Mesko)

Troop Transport

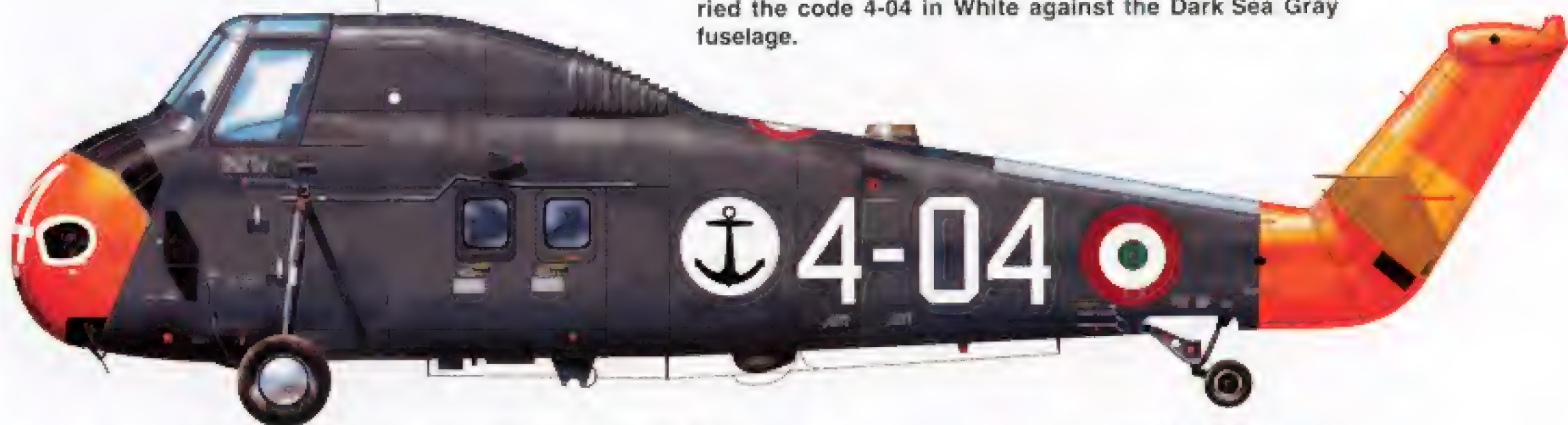


This Fuerza Aerea de Nicaragua H-34 926 served with the Somoza forces before the revolution. The spine and belly antennas suggest at least a partial upgrade to H-34C standards. According the FAN, all of their Chocotws were destroyed following the Sandinista victory, although records suggest that at least one saw brief service in the Sandinista Air Force. (Smithsonian)

MEDEVAC Configuration



This Italian Navy HSS-1N of No 1 Gruppo Elicotteri carried the code 4-04 in White against the Dark Sea Gray fuselage.



West German Army H-34G.IIIs were painted in overall RAL6014 Gelboliv (Olive Drab)



This Royal Canadian Air Force H-34A flew with the Air Transport Command during February of 1958. This Choctaw crashed and was written off on 10 February 1959.



This JH-34A (53-4493) is armed with four machine guns, forty rockets and two missiles. This was one of several armament configurations tested on H-34s.



This VH-34A of the Presidential Flight was equipped with an early style tail float.





This HUS-1L was named King Pin II and was flown by VX-6 in Antarctica.



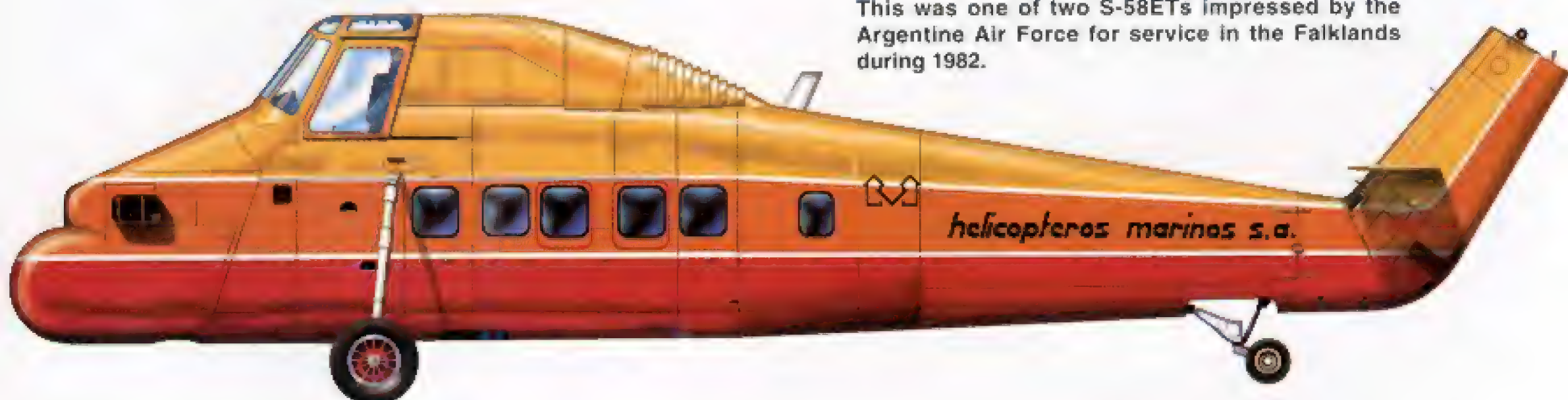
A Coast Guard HH-34G (1332) rescue helicopter. This aircraft was stationed in New Orleans and later in St. Petersburg.



A Sikorsky S-58 (CH-34C) of the Israeli Defense Force/Air Force.



This Belgian Air Force S-58C was originally built for Sabena as OO-SHM.



This was one of two S-58ETs impressed by the Argentine Air Force for service in the Falklands during 1982.

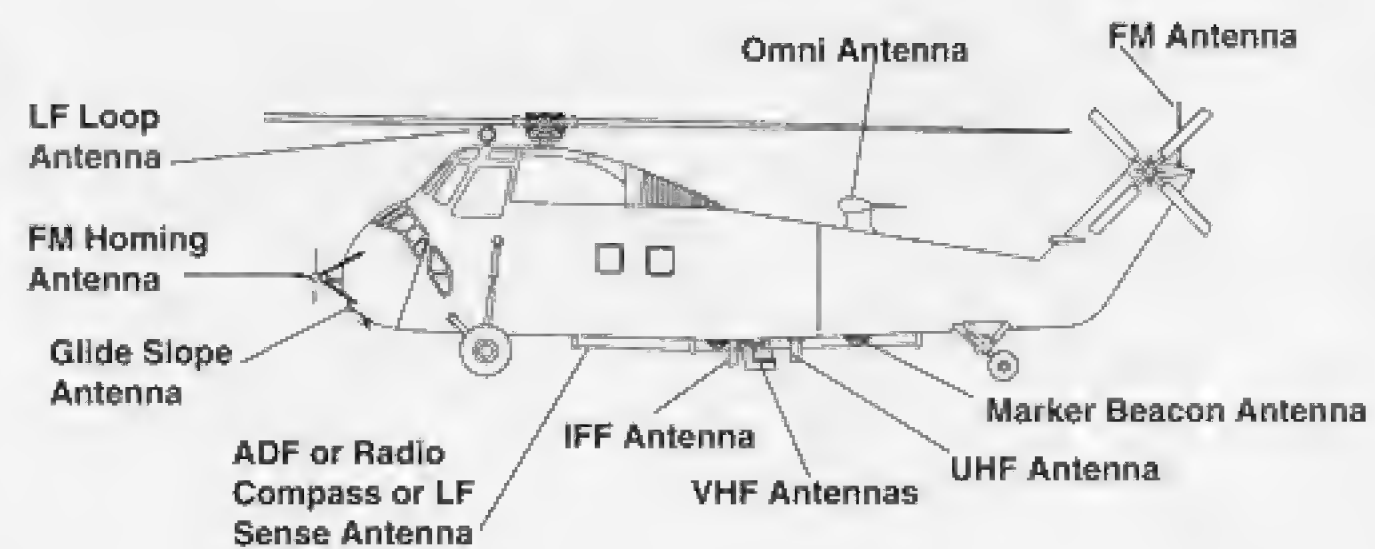


Service in Algeria, with its harsh sun and blowing sand, quickly weathered aircraft finishes. This H-34A (58-477) was a Sud Est-assembled aircraft serialied SA.40. (SHAA)

SA.98 was a Sud-produced H-34A. While assigned to EH68/2 for rescue flights, it carried a Dark Olive Drab scheme with Red-Orange markings, similar to West German aircraft. (SHAA)

Choctaw Antennas

H-34A/C



H-34G.I

West Germany purchased twenty-six H-34As between July of 1957, and June of 1958. Flown from Bridgeport to New York and then transported by ship to Germany, these were designated as H-34G.Is in Bundeswehr service. All but three, written off in accidents, were transferred to the German Navy.

H-34B/CH-34B

Produced as H-34As, these reflect the installation of ASE. The number modified is unknown, and it is not clear that this was an official designation.

H-34G.II

Germany obtained twenty-five Choctaws between July of 1959, and February of 1960, under the H-34G.II designation. Sikorsky records show these as H-34As, but the production installation of ASE, which distinguished them from the H-34G.I, would make them the equivalent of H-34Bs in U.S. Army service. All served in the Navy after being retired from the Bundeswehr.

H-34C/CH-34C

At least 190 H-34As and H-34Bs were upgraded to H-34C standards. The H-34C differed from the H-34A/B in that ASE was installed as standard along with an automatic hover coupler and Doppler navigation unit. Externally, these are difficult to distinguish from other Army models. Other operators are known to include Thailand and the VNAF.

VH-34A and VH-34C

During the Eisenhower administration, the Presidential air fleet grew dramatically. Rotorcraft were considered sufficiently developed to allow their safe inclusion and a large fleet of H-34As were used by the Executive Flight Detachment. Four were fitted with plush interiors, including improved soundproofing, air conditioning, and airliner-style seats, under the designation VH-34As. These were also equipped with inflatable floats for emergency water landings, requiring installation of the hi-stack exhausts and modified left hand engine access door. The rest were stock H-34As, used in support. With upgraded avionics, the VH-34As became VH-34Cs. When replaced by VH-3As, the VH-34s were returned to regular Army aviation units.

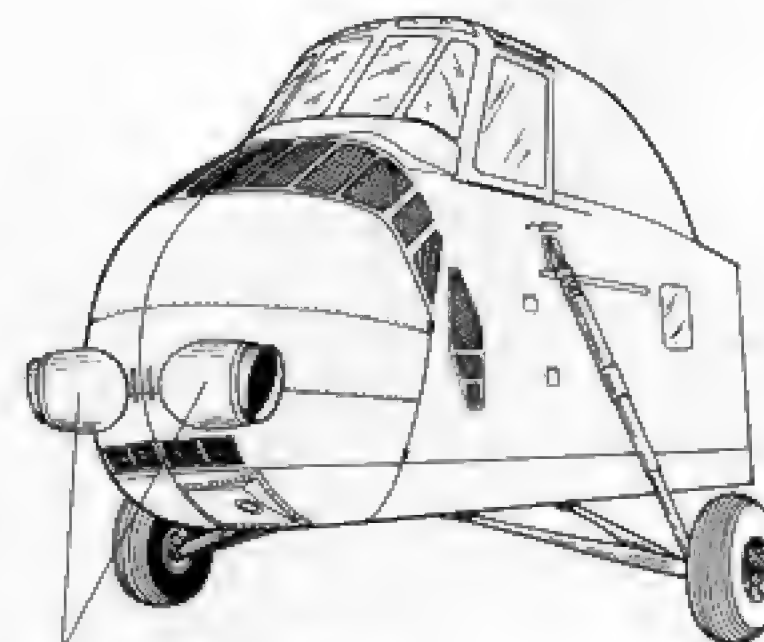
JH-34A and JH-34C

These designations were temporarily applied to some, but not all, airframes modified for use as weapons testbeds.



Sud's turbine experiments with the H-34 centered on Turbomeca's Bastan engine. Unlike the HSS-1F and Wessex, only the clamshell doors underwent surgery for this conversion. Two aircraft (including this aircraft, SA.76) were flown, but no production was undertaken. (Turbomeca)

Bastan Engine Installation

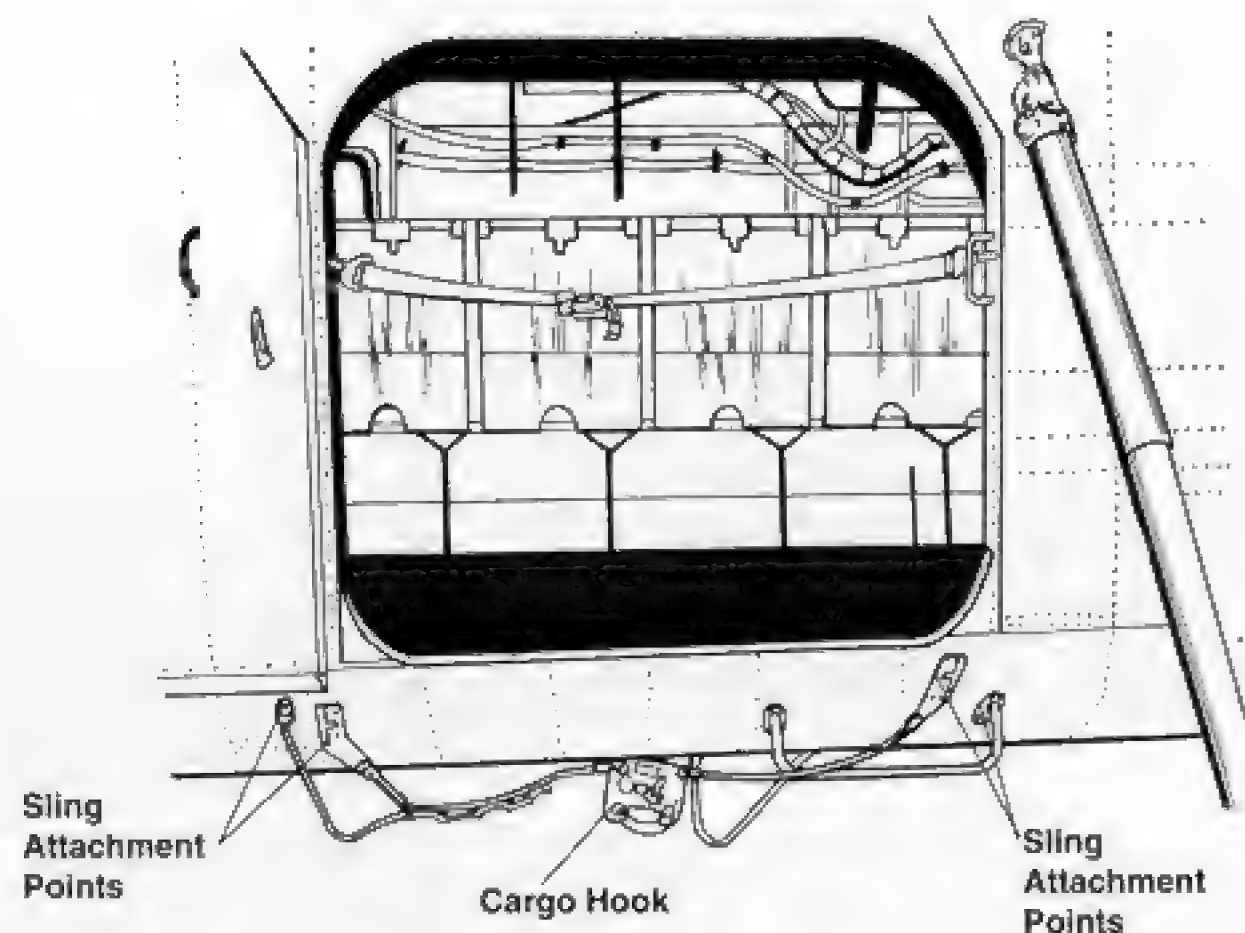


Twin Exhaust Stacks



AS+342 was the second H-34G.I delivered to the Bundeswehr. It was conducting a test flight at Sikorsky, before being fitted with radios, under fuselage sling and hoist. Following a crash, it was written off in January of 1961. (United Technologies, via Dana Bell)

5,000 Pound Cargo Sling



Only West Germany, and possibly the U.S. Army, operated Choctaws equivalent to the H-34B and the Germans designated them H-34G.IIs. This aircraft, 80+29 of MFG5 served until 1970, by then it had been equipped with FM radio homing antennas and a hi-stack exhaust, typical modifications to both the G.I and G.II models. (MAP)

The Army pursued conversions of H-34As to C models throughout the Choctaw's service life. The most obvious modification was the addition of various antennas to the nose and upper tailboom. This H-34C (53-4529) was lifting a crashed Italian Army Westland Scout during July of 1961. It served with the 110th Aviation Company, Southern European Task Force. With most Choctaws stationed in Europe, the Army took the H-21 to Vietnam. (Army Aviation Museum)





"Mr. Swamp Fox" (54-3016) was one of six H-34Cs which participated in Operation LEAD DOG, the testing of winterization equipment in Greenland during mid-1960. The overall Red-Orange scheme used in Greenland gave way to Red-Orange and White, guaranteeing visibility over any terrain. (Army Transportation Museum)

This H-34C (57-1760) was one of the last twelve H-34A models delivered to the Army. Its Olive Drab and Day-glo finish was well worn and patched. Arrayed on the flightline behind it are its ancestors, contemporaries, and descendants: H-19s, H-21s, and H-47s. (U.S. Army via Dana Bell)



This H-34C (54-3033) was the sole example equipped with ski landing gear for operational tests under Arctic conditions. (United Technologies)

Royal Thai Army troops move away from the Landing Zone (LZ) at Camp Nong Takoo during training. The flat side canopy window identifies the aircraft as a rebuilt H-34A. UHF antenna mounts line the upper fuselage. Eighteen Thai Choctaws would eventually be converted to turbine power. (U.S. Army Aviation Museum)





VNAF H-34s came from many sources. From left to right: UH-34D 44639 (ex-USAF HH-34D 60-6913, ex-USMC UH-34D 144639), H-34C 43983 (ex-USA H-34A 55-5261, ex-USMC UH-34D 143983); H-34C 53-4511 and H-34C 53-4498. The ex-Marine aircraft were eventually lost in combat. (USAF via Jim Mesko)

ARVN troops board their Choctaw for a strike against the Viet Cong on 8 February 1963. The eighteen seat interior has been fitted, along with all the standard H-34C antennas. 54-496 was the twenty-second Choctaw delivered to the Army, and survived its service with the VNAF. (Army, via Jim Mesko)



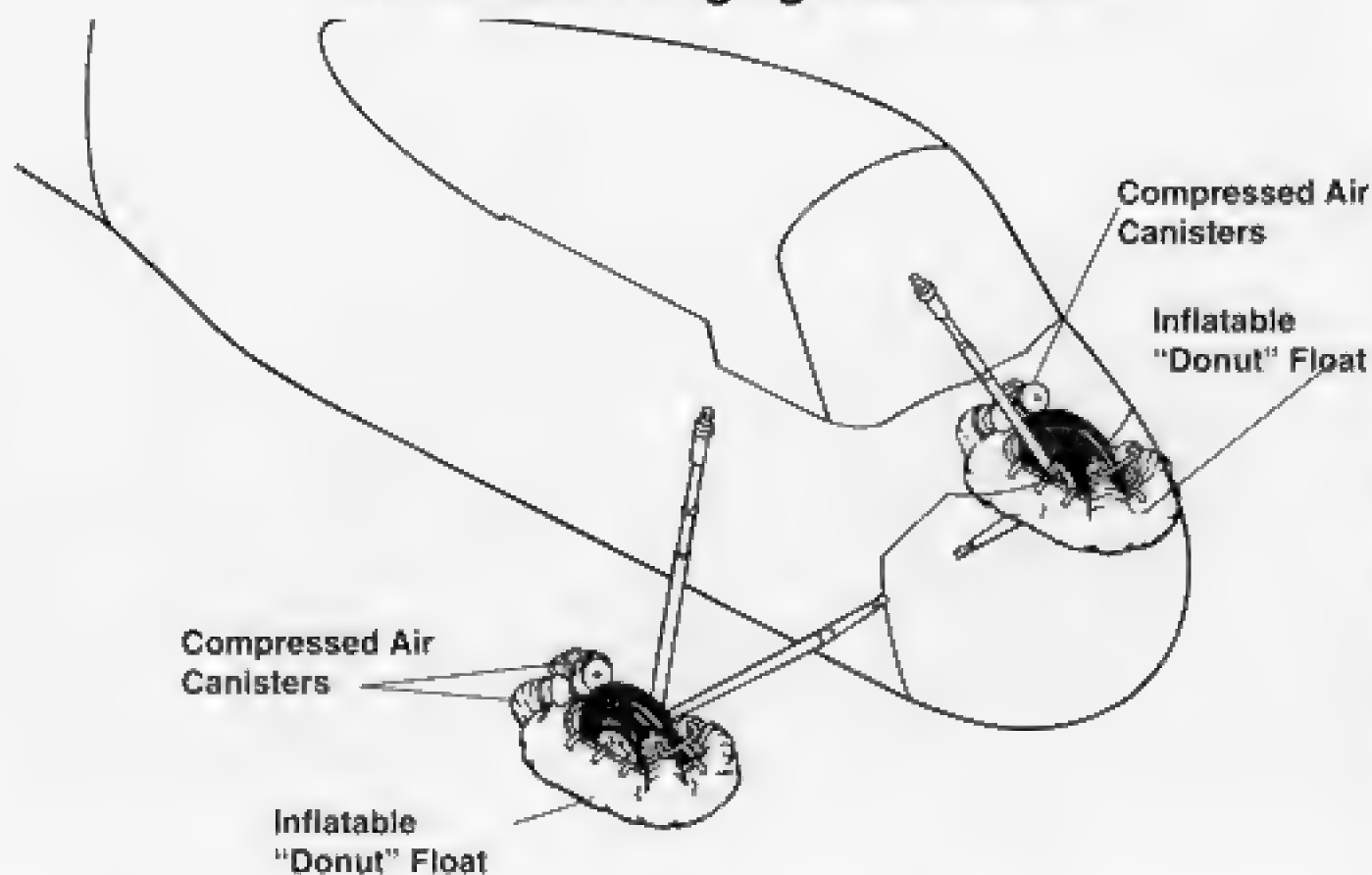
There were aircraft covers as part of H-34's equipment, and then there were the experimental covers designed for shipment. This H-34C was wrapped like a Halloween ghost at the Depot Maintenance Center in Corpus Christi, Texas where the tests were at one time labeled "Classified." (Army Aviation Museum)





Officers and enlisted men of the Executive Flight Detachment pose before one of the Presidential VH-34As. EFD aircraft were stock H-34As when produced and were upgraded to VIP standards after acceptance and delivery. (U.S. Army Aviation Museum, PN4880)

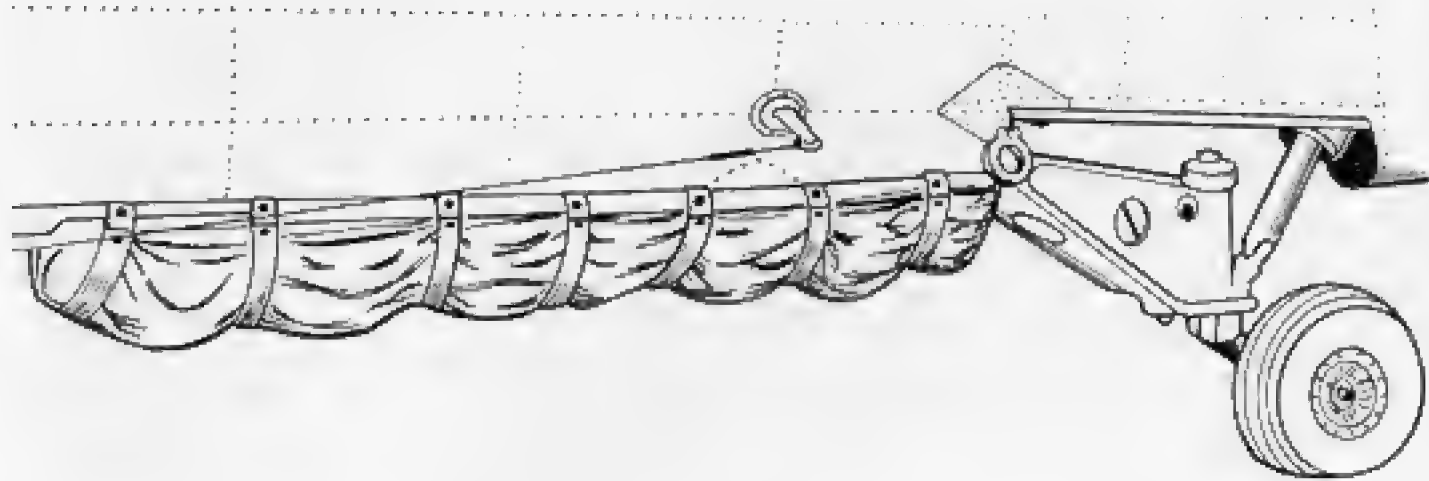
VH-34 Main Landing Gear Floats



One of the VH-34Cs (56-4320) has been preserved by the Army Aviation Museum at Fort Rucker. In Army service, only the VIP aircraft were float-equipped and required the hi-stack exhaust. The executive interior was spartan compared to the S-58C, but certainly more suited to heads of state than combat seating. Detail differences between the two aircraft on this page are probably due to the restoration process, since 56-4320 has cheat lines more closely resembling VH-34Ds than other Army VH-34s. Army elements of the EFD operated in the Washington, D.C. area, while Marine VH-34Ds were most often seen accompanying Presidential trips overseas. (Author)



VH-34 Tail Float



The XM6 (XM153) twin 7.12MM gun mount was tested at Aberdeen Proving Grounds on JH-34C 53-4481, the Army's seventh Choctaw. The co-pilot's station was fitted with a gunsight to follow the weapon through its limited traverse and elevation. The Orange nose and fuselage band reflect pre-testbed service with a regular aviation unit. (Ordnance Corps via Army Aviation Museum)



This well-worn JH-34A was fitted with an experimental aerial mine dispenser. The procedure was cumbersome and slow, and would have been even less practical on fixed-wing aircraft than it was on slow-moving helicopters. (Army Aviation Museum)

With the XM6 system installed, 53-4481 had to have a hi-stack exhaust system. The XM6 found its way to Vietnam on Bell UH-1 Hueys, often coupled with rocket pods. (Ordnance Corps via Army Aviation Museum)



HUS-1/UH-34D Seahorse

Following the Second World War, Marine Corps doctrine underwent major changes. Amphibious assaults against Pacific islands had been high in human costs. While unavoidable, frontal assault needed to be part of a larger strategy. This was especially true in light of concerns over the battlefield use of nuclear weapons, which could destroy a fleet in a single blow. The helicopter was an obvious counterpart to the landing craft, since it was both surer and swifter than paratroops. Vertical envelopment, the movement of assault forces to positions behind the enemy by helicopter, came into being through Marine Corps use of the HRS (H-19). Before the war in Korea was over, the HRS was waiting to be replaced in yet another role by a larger, swifter, more powerful aircraft. The replacement was, again, a H-34 variant.

The Marines, in search of a new vertical envelopment aircraft, focused their attention on Sikorsky's HR2S, a heavy lift helicopter. They did not envision a medium-lift machine until 1956, when delays in the heavy-lift program became unbearable. Their choice was the same transport version of the S-58 that the Army had chosen when H-21s were not available. With the HSS-1's reliability proven in the Fleet, extensive testing was bypassed and the HUS-1 entered service during early 1957.

Until a revised main gear arrangement was introduced beginning with serial 148053, after H-34A production had ceased, the HUS-1 and H-34A were essentially identical aircraft. Only the twelve troop seating configuration was installed in the HUS-1 and hinge dampers were added to the engine access doors. The HUS-1 also carried a CO2 fire extinguisher, the same electrical system as the HSS-1, and flashing White lights on the tail and fuselage tub. The three barrel hi-stack exhaust with flame dampers was standard from serial 147178 and retrofitted to earlier aircraft. The production run of 640 airframes represented a third of all H-34s built.

In addition to the radios that were standard on the Seabat, Seahorses carried an AN/ARC-44 FM liaison set. Later aircraft mounted the AN/ARC-39 HF transmitter/receiver and the AN/ARN-59 LF radio compass in place of the avionics used on the HSS-1.

The Seahorse is probably best known for its service in Vietnam, where at least eight UH-34D aircrewmembers earned the Navy Cross. Beginning with Operation SHU FLY, which ran from April of 1962, to December of 1964, and continuing through its recall to combat when problems were encountered with the UH-46, the HUS-1 was the main assault helicopter for the Marines as well as carrying out large numbers of ARVN operations. Operations in Vietnam quickly retaught the lessons learned by the French in Algeria. Defensive armament was fitted, beginning with M3 sub-machine guns and sling-mounted automatic weapons and leading to swivel-mounted M60 machine guns. Following losses due to bullet strikes in the exposed engine and oil cooler areas, armor plate was fitted under the nose. An additional lesson was the height of the cabin floor compared to the shorter ARVN troops, and boarding steps were soon fashioned in the field to allow easier access by combat-equipped troops.

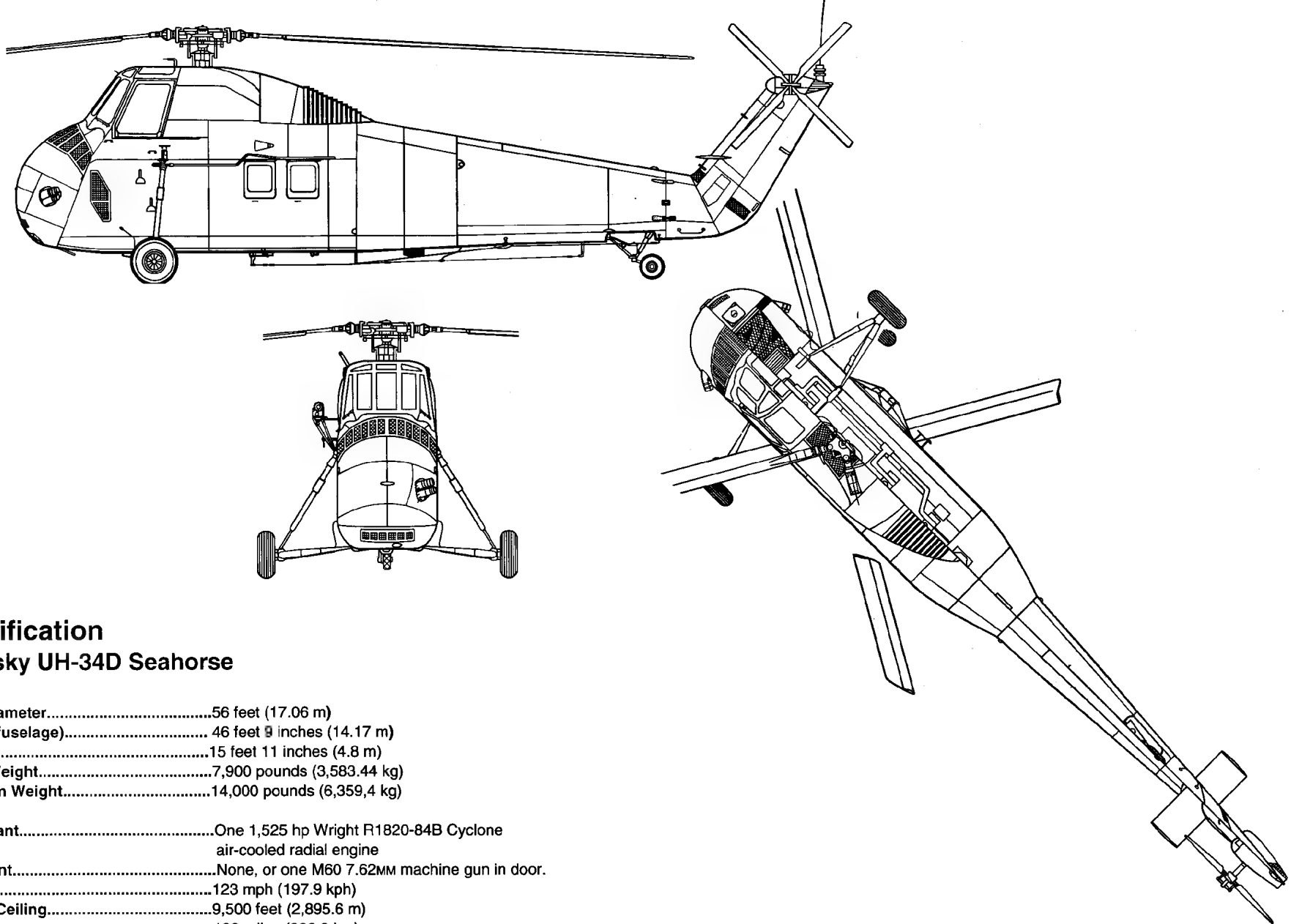
The Seahorse served wherever the Marine Corps was to be found; during the Cuban Missile Crisis and in the Dominican Republic; as a recovery aircraft for manned space flights; supporting disaster relief and rescues in the Pacific Northwest, Haiti, Honduras, Japan and Vietnam; transporting federal troops to Oxford, Mississippi; fighting forest fires and mosquito

(Right) A Second Marine Division Pathfinder waits as a HUS-1 comes into a Landing Zone (LZ) at Vieques, Puerto Rico, during combined arms exercises. Vertical envelopment was the Seahorse's reason for being, but the deployed cargo sling indicates this aircraft is engaged in a cargo lift mission. (National Archives)



ET-44 (BuNo 148767) lifts Alan B. Shepard, Jr., away from Mercury 3, the first U.S. manned suborbital flight, on 5 May 1961. The 5,000 pound capacity sling has already been connected to the capsule, which will be lifted and flown back to the USS CHAMPLAIN. (NASA via Dana Bell)





Specification Sikorsky UH-34D Seahorse

Rotor Diameter.....	56 feet (17.06 m)
Length (fuselage).....	46 feet 9 inches (14.17 m)
Height.....	15 feet 11 inches (4.8 m)
Empty Weight.....	7,900 pounds (3,583.44 kg)
Maximum Weight.....	14,000 pounds (6,359,4 kg)
Powerplant.....	One 1,525 hp Wright R1820-84B Cyclone air-cooled radial engine
Armament.....	None, or one M60 7.62MM machine gun in door.
Speed.....	123 mph (197.9 kph)
Service Ceiling.....	9,500 feet (2,895.6 m)
Range.....	182 miles (292.8 km)
Crew.....	Three



Marine Corps HUS-1s arrived in Vietnam unarmed, unarmored and clean. Aircraft of HMM-362, participating in Operation SHUFLY, lift ARVN troops into combat during 1962. Overall scheme is Field Green (FS 34097) with Orange Yellow (FS 33538) rear transmission covers and White wheels. (Army Signal Corps via Jim Mesko)

A HMM-361 UH-34D (BuNo 150226) brings ammo to a Third Marine Division fire base during Operation STARLITE, south of Chu Lai, on 18 August 1965. Nose armor has been installed, and a M60 is fixed in the forward port escape window. (USMC via Dana Bell)



YZ-76 (BuNo 145771) hovers above the deck of an LPH. The hi-stack exhaust, even with flame dampers, required a glare shield below the co-pilot's corner window. The flush mounted navigation lights caused reflections off the curved cockpit side windows which could induce vertigo. As a result the lights were mounted on "elephant's ears" away from the fuselage. (Sikorsky via Dana Bell)

The high-visibility markings have been painted over on these HUS-1s. The aircraft to the left has an extended, single-barrel hi-stack exhaust, and might have been a UH-34E. The UH-34D coming off the deck is an early production model with bent-legged main landing gear, lo-stack exhaust, and flush navigation lights. The H-37 represents the heavy-lift capability aircraft. (Sikorsky via Dana Bell)





This UH-34D has a twelve-seat interior, overhead soundproofing, and heater ducts high on the fuselage walls. The cockpit floor and forward wall are visible above the bulkhead at the front. (Sikorsky via Dana Bell)

This overall Field Green (FS 34097) UH-34D (BuNo 150556) served as the ship's helicopter for USS TRIPOLI (LPH-10) until 1970. The wide, deep stairs are a holdover from combat duties in the Marine Corps in Vietnam. (Author)



VC-1, flying out of Barbers Point, Hawaii, operated UH-34Ds (BuNos 149376 and 150208) in overall Light Gull Gray (FS 36440) with a Light Blue (FS 15102) fuselage band containing white-bordered Yellow-Orange (FS 33538) stars. The Black emblem within the band is a Spartan's head. 149376 has a Darker Gray walkway between the Blue band and the tail pylon fold point. (Jim Mesko)

Seahorses served in training squadrons as well. This overall Semi-gloss Fluorescent Red-Orange (FS 28913) UH-34D (BuNo 150290) went from the Marines to HT-8. Like so many H-34s, it ended its days in the Arizona desert. (National Archives)





This UH-34D (63-13210) was given an Air Force serial when taken from the production line for Military Assistance Program delivery to the VNAF. To meet USAF naming conventions, it shows in Sikorsky company records as a CH-34C. (Timothy Kerr)

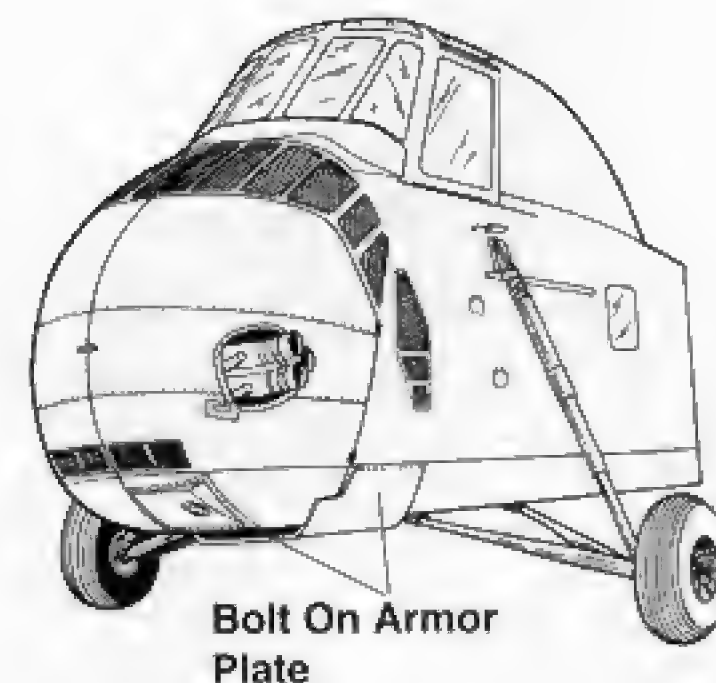
The ultimate in bent-legged main landing gear! A Viet Cong mortar was responsible for the shrapnel damage to this UH-34D at Binh Thuy Air Base on 7 May 1967. The serial is misleading, since this is an ex-USMC aircraft (BuNo 145777). (USAF via Jim Mesko)



This UH-34D (BuNo 148076) was one of many Seahorses transferred to the VNAF by in-country Marine units. It was probably Olive Drab (FS 34087), judging by the low-visibility tail markings, while the aircraft to its right was Field Green (FS 34097). (USAF, via Jim Mesko)

UH-34 Bolt On Armor Plate

UH-34D





The early days of Operation SHU FLY were not without their lessons and helicopters in Vietnam were quickly armed. This Seahorse is armed with a .30 caliber air cooled machine gun with a modified ammunition feed. (USAF via Dana Bell)

A Bullpup-armed UH-34D was successfully operated on a test basis. Trials took place at Fort Rucker during 1961, but did not lead to regular use of the missile as a helicopter weapons system. (U.S. Army Aviation Museum)



This Marine door gunner is armed with a standard M-60 7.62mm machine gun with its ammo box under the crew chief's canvas seat. The Marines in the Seahorse are armed with M14 7.62mm rifles. (National Archives)

Less flexible than a door-mounted gun, and only marginally less fanciful than the Bullpup missile on the same aircraft's starboard side, was this Hughes 20mm cannon pod. The folded board below the sliding window is an additional exhaust glare shield for the co-pilot. (U.S. Army Aviation Museum)



tees; hauling cargo of every description for every purpose.

As the Boeing UH-46 Seaknight began to replace the UH-34D in Marine squadrons, the Vietnamese Air Force (VNAF) received a number of Seahorses by direct transfer in the field; these operated side-by-side with ex-Army H-34s, and faced the same parts and maintenance problems which finally led to the type's replacement in the VNAF by Bell UH-1s. The U.S. Army took twenty-three from the Marines, redesignating them as H-34As; these were then upgraded to H-34C standards and transferred to the VNAF.

Forty-four of the fifty-two UH-34Ds taken by the Air Force for MAP deliveries also went to the VNAF. Cambodia received two UH-34Ds when their pilots defected to Phnom Penh during 1966. The Philippine Air Force operated six Seahorses during the 1960s and early 1970s in a variety of roles. The Dutch Navy purchased one UH-34D, which operated with its SH-34Js. Along with eight machines taken from the production line, twenty-three UH-34Ds were transferred from Marine to CIA control in Southeast Asia, where they supported covert operations in Laos; additionally, other Seahorses were occasionally loaned to the Agency for operations. As early as 1959, the Navy received HUS-1s for use in utility squadrons; these aircraft pioneered the vertrep concept. Surplus Marine UH-34Ds were also obtained for cargo and utility duties, including use as ship's aircraft aboard the amphibious assault ships (LPHs) which had been home to Marine UH-34D squadrons for over a decade.

OH-34D

UH-34Ds operated by Marine Observation Squadrons were sometimes referred to in print as OH-34Ds. This was not an official designation, and no modifications were made.

HUS-1A/UH-34E

Equipped with inflatable floats like those on the VH-34A and VH-34G, and full sound-proofing like the HSS-1, forty HUS-1As were produced to provide the Seahorse with amphibious capabilities. An external 150 gallon fuel tank could be fitted on the port side, and one of the port windows was a bubble type to aid in observation. A single-barrel hi-stack exhaust was fitted until replaced with the three-barrel type. Several, stripped of floats, served with VX-6 in Antarctica, leading to development of the HUS-1L. Three were equipped for all-weather night-flying and carried in Sikorsky records as HUS-1ANs.

HUS-1L/LH-34D

Four HUS-1As, without floats, were equipped with fixed winterization kits, including upgraded heaters, and designated HUS-1L. These also had an engine governor, HSS-1N avionics and instruments, and two 1500-volt inverters. These aircraft spent their service lives exclusively with VX-6 as part of Operation Deep Freeze in Antarctica.

HUS-1Z/VH-34D

Eight HUS-1As were produced with executive interiors as HUS-1Zs. These operated worldwide as part of the Eisenhower and Kennedy air fleets until replaced by the VH-3.

One UH-34D, equipped comparably to VH-34D standards, was produced for delivery to Indonesia. Then Soviet Premier Khrushchev ordered two HUS-1Zs during 1959, after his visit



One of the two Royal Laotian Air Force UH-34Ds, gifts from defecting Vietnamese Air Force (VNAF) pilots. (SHAA)

to the United States. These were shipped, but have since disappeared, and no record exists of their fate in Soviet service.

The Dutch Konink Marine operated two H-34s with the serial 134. The second was this UH-34D (BuNo 150729), taken up by the Fokker School after its retirement from military service in 1972. The aircraft served at the school as an instructional airframe. (Anthony Fokker School)

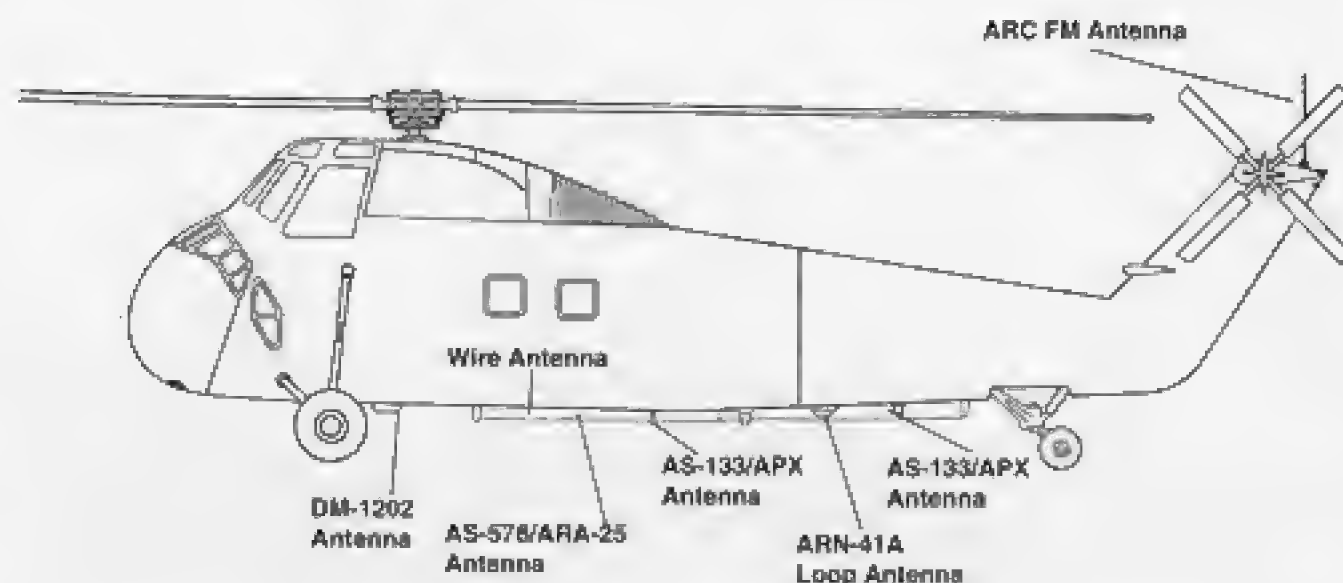




It sometimes seems that no two H-34s, of any model, have quite the same antenna suites. Some even had add-ons which escaped the manuals. A case in point is the air-foil-shaped high frequency antenna on the port side of this UH-34D (154895) from H&MS-24. (Author)

Seahorse Antenna Configuration

HUS-1



A HUS-1A/UH-34E shows off its features: long-range tanks, extended single-barrel hi-stack exhaust, and amphibious landing capabilities. XM-25, of HMX-1, was probably overall Semi-gloss Fluorescent Red Orange (FS 28913) in keeping with its experimental role. (Author)

HUS-1G/HH-34F

The Coast Guard operated six modified Seahorses in the SAR role between 1959 and 1963. These differed from the HUS-1 in a number of details. HSS-1 type fuel cells were fitted, and HUS-1A external tanks were carried. The hi-stack exhaust was standard, as were HSS-1N all-weather avionics, electrical systems, instruments, and the R1820-84B power plant. Seating provisions were made for ten passengers and two observers, with both port windows being the bubble type.

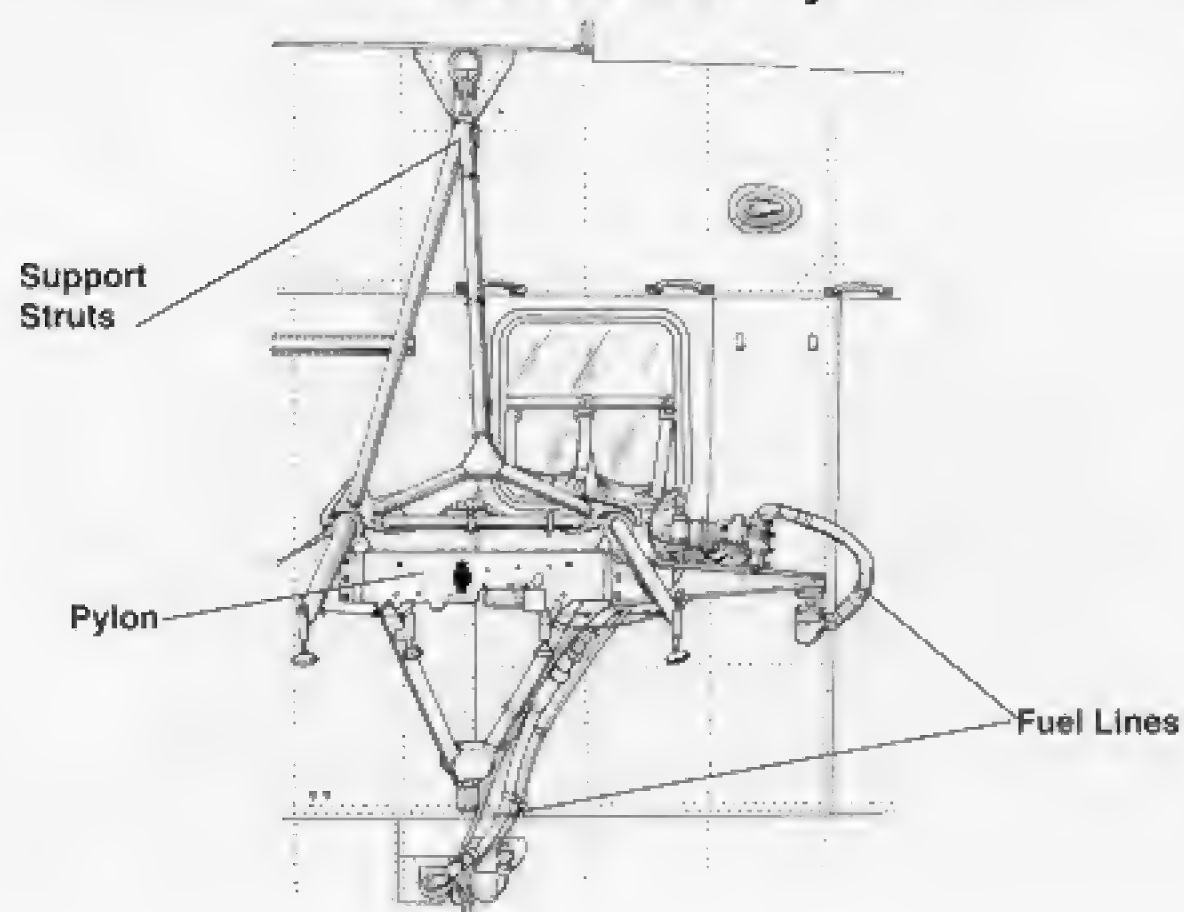
The HUS-1Gs operated from Saint Petersburg and New Orleans. They continually suffered from unexplained loss of power, and three were destroyed in crashes during rescue operations.

HH-34D

Ten H-34Ds were transferred to Air Force control as HH-34Ds for MAP distribution. The bulk of these went to the VNAF, where they were again designated UH-34Ds.



External Fuel Tank Pylon

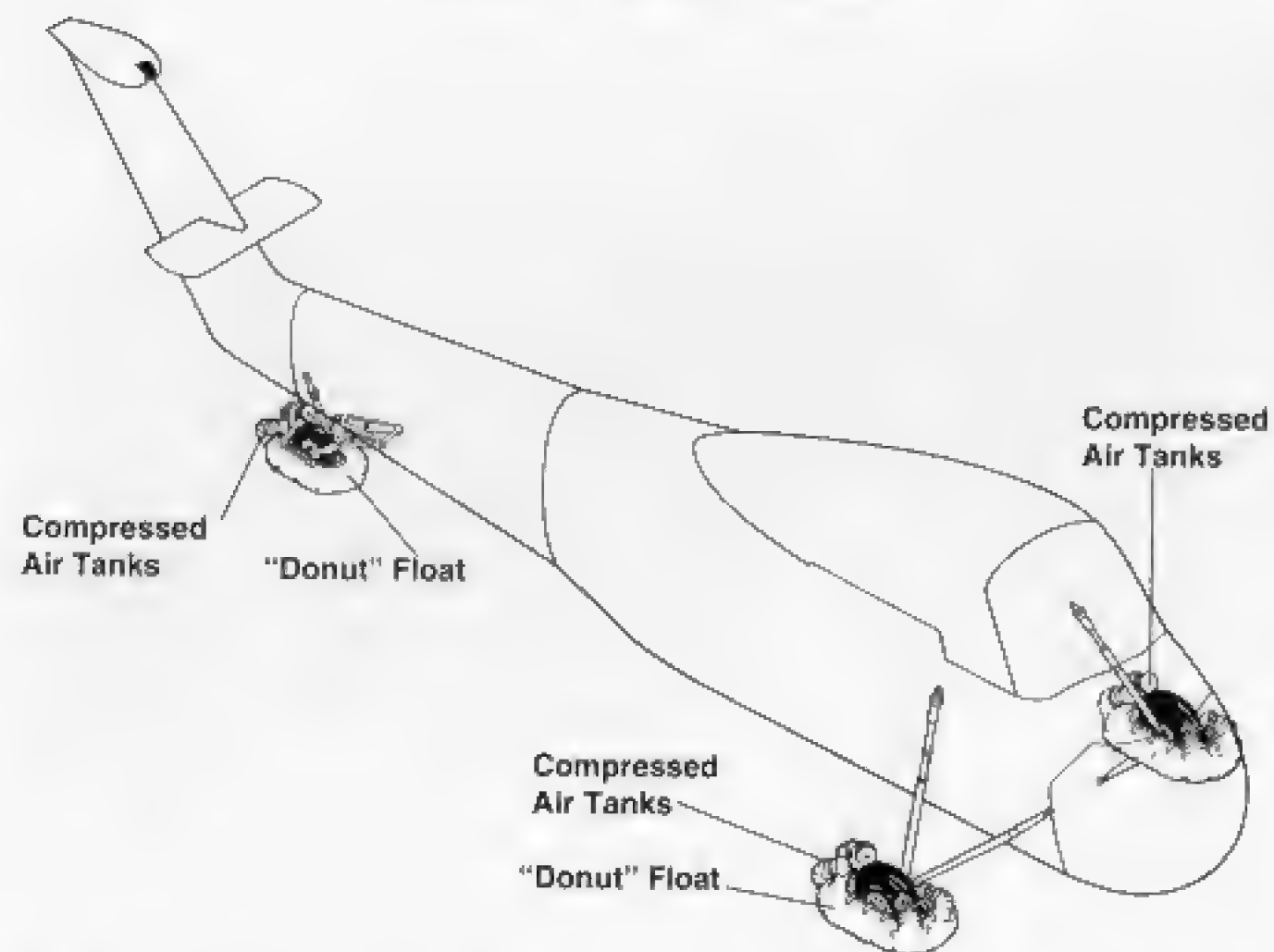


King Pin II on the ramp at NAS Quonset Point in July of 1957, before VX-6's deployment for Operation Deep Freeze 3. The HUS-1Ls were converted HUS-1As, and XD-25 retains the amphibian's exhaust even though the floats have been removed. (Ken Snyder)

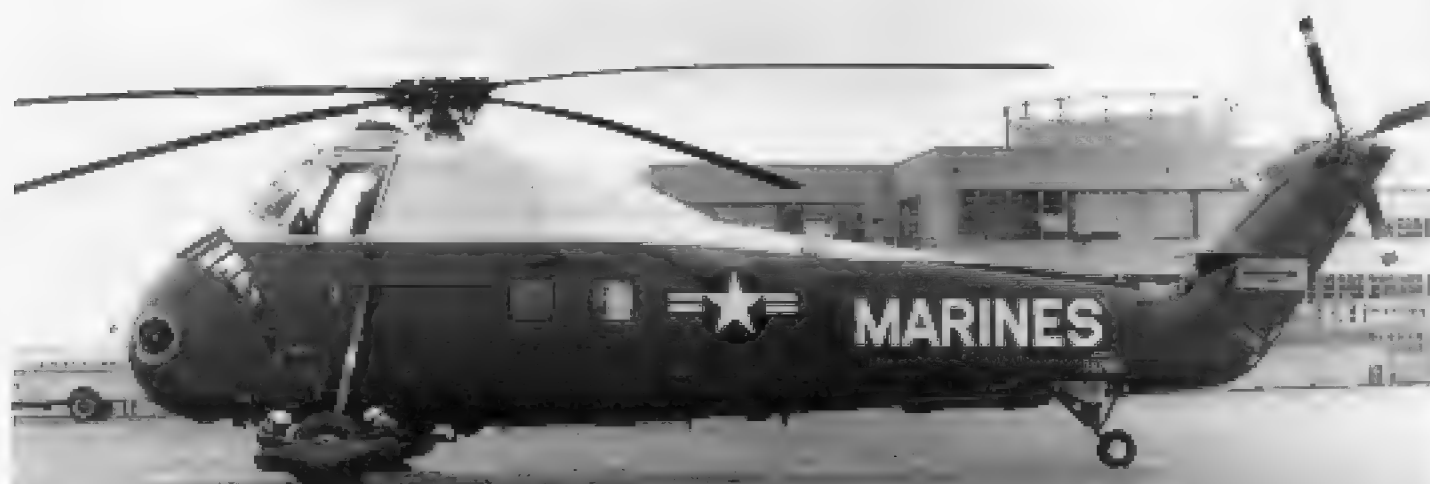
By January of 1958 the aircraft (144657) was far less pristine, and appeared to have had the tail pylon replaced. LCDR Ken Snyder was the pilot when *King Pin II* set a record by flying non-stop from Little America to NAF McMurdo. The 450-mile trip, which took five hours, occurred on 7 December 1957. (Ken Snyder)



HUS-1 "Donut" Floats



This HUS-1Z (BuNo 147191) was part of the Marine Corps' contribution to President Eisenhower's transportation. Built with bent-leg gear, it was converted to the later style gear before becoming a VIP aircraft. Like Army VH-34s, this aircraft is Gloss Olive Drab (FS 14087) and Insignia White (FS 17875). (Smithsonian)



With the branch-of-service logo out of the picture, only the boarding handrail and the Globe-and-Anchor above the door readily distinguish an early HUS-1Z from a VH-34A. President Eisenhower and Premier Khrushchev prepare to board the first Marine One (BuNo 147161) during the latter's 1959 visit to America. (Smithsonian)

As a result of the Khrushchev's flight, the Soviets obtained two HUS-1Zs (c/n 1241 and 1242) at the end of 1960. Extra antennas adorned the fuselage, along with a civil registration for test flights and a full complement of English-language stencils. The colors are thought to have been Light Orange with Yellow trim. (Sikorsky via Dana Bell)





All HUS-1Gs were overall Gloss Orange Yellow (FS 13538). With three of six crashing, the Coast Guard Seahorses were actually outlived in service by their HO4S-3G/HH-19G predecessors. Aircraft 1334 demonstrates rescue techniques in the New Orleans area. (Coast Guard Historian's Office)

This Seahorse began and ended its service life as a UH-34D, but between USMC and VNAF service the Air Force called it an HH-34D. Heavy shrapnel damage occurred at Binh Thuy on 7 May 1967. (USAF via Jim Mesko)



Coast Guard HUS-1Gs combined the best and most useful features of both the Seahorse and the Seabat. Only six were acquired, and their service life was short. Aircraft 1336 operated from New Orleans. (Coast Guard Historian's Office)

A typical H-34 cockpit, in this case belonging to a UH-34D on the production line during 1962. The pilot and co-pilot seat pans could be folded up to allow movement between the cockpit and cabin. Critical flight instruments were repeated on both sides of the instrument panel. Trim, ASE, hoist, and cargo release controls were located on the cyclic control stick grips. (Sikorsky)



S-58 Civil Helicopter

S-58B

Intended as a cargo and utility helicopter for the civilian market, the eighteen S-58Bs were not just demilitarized H-34s. The standard power plant was the civilian 989C9HE-2 air cooled radial engine. The electrical system included a forward left mounted 24-volt battery (with provisions for a 36-volt system) and a 300-amp engine-driven generator. The auxiliary hydraulic pump was mounted underneath the engine, while the 1,000 psi reservoir for the auxiliary servo system was placed on the transmission deck. Fire suppression consisted of detection systems in the engine and heater compartments, a hand-held extinguisher in the cockpit, and an optional hand-held unit in the cabin. The firewall, engine supports, forward tub skin, and lubricating system fittings were stainless steel.

Standard fuel capacity was 193 gallons, with an extra 92 gallons in a three-cell bladder available, and engine oil was reduced to 10.4 gallons in a single stainless steel hopper; automatic and manual oil shutoffs were incorporated. Gyro and co-pilot instrumentation were optional, as were parachute flares in the tail, 450-watt left-hand and 600-watt right-hand landing lights in the nose, a 600-watt landing light in the right rear fuselage, twelve-man seating and eight litters. Full cockpit and cabin soundproofing were installed, and a 100,000 btu cabin heater was located in the tail boom.

The radio compartment was moved from the tailboom to the front of the cabin. One low, full-length step was set beneath the cargo door. Two hotdog floats, or three donuts, could be installed; these required use of the hi-stack exhaust. Exterior lights were made up of Red and White tail lights, flashing Red and Green lights port and starboard, a small pylon-mounted beacon, and an optional Red passing light in the nose.

Having noted these differences, it is unclear if any S-58Bs saw military service. Sikorsky records show RCAF aircraft as S-58Bs, but all equipment was consistent with the H-34A. Records also show three S-58Bs were delivered to the Israeli government in 1958, but these forerunners of the HSS-1N/CH-34C hybrids might have been H-34As posing as B-models to bypass trade restrictions.

S-58C

The seventeen S-58Cs were configured for passengers, and possessed most of the same differences from military aircraft as the S-58B. The obvious changes between the S-58C and other models were to the cabin. Internally, this was split latitudinally into two compartments, each equipped with fixed soundproofing and airliner-style seating for six persons over a reinforced cabin floor. A cargo compartment was located between stations 82.5 and 112, and had its own right-hand access door. In place of the large sliding door on military aircraft, each cabin compartment had a hinged passenger door on the right-hand side, with a double step beneath each door. Six windows were fitted on each side. An additional fire extinguisher was found in the heater area. Like the S-58B, the S-58C could be fitted with the cargo sling. Unlike all other models, there was no provision for a hoist or tail folding.

The first S-58C was delivered to New York Airways in August of 1956, and the second to Sabena the next month. After service with Sabena, five were transferred to the Belgian Air



N9F was the export registration for one of three S-58Bs (c/n 437, 691 and 692) sold to Israel during 1958. The Olive Drab and Tan aircraft was parked on the ramp at Bridgeport prior to delivery. (United Technologies)

Some of Chicago Helicopter Airways' S-58Cs were leased to Sabena, and in turn went to the Belgian Air Force. OT+ZKR/BI5 was N869 while in Chicago and 00-SHQ while with Sabena. After military service, it went to Germany's Meravo as D-HAUG. (Rudy Binnemans)



Force in 1963 and two in 1969; included in the latter was a Chicago Helicopter Airways aircraft leased to Sabena in 1963. Retaining their plush interiors, these were operated in the VIP role with serials B9 through B15.

S-58T/H-34T

This designation covers a variety of production models, having in common conversion from Wright piston engines to Pratt & Whitney (Canada) PT6T-3 and PT6T-6 Twin-Pac turbines. Aircraft powered by the two different turbine models are externally indistinguishable. The S-58T was first flown on 19 August 1970. There were no production aircraft. Rather, Sikorsky offered to sell refit kits or provide the change at its factory. All S-58Ts reflect the features of their original models, and the modifications and upgrades made during their service lives. A number of firms were engaged in S-58T conversions; California Helicopter bought all rights in the early 1980s, and designated military variants as H-34Ts.

At least two of the Nicaraguan H-34As were converted, and one of these served with the Sandinista Air Force. The Fuerza Aerea Argentina operated two ex-American S-58ETs, and later pressed two S-58ETs from Helicopteros Marinos S.A. into service; the latter were used between 18 May and 23 June 1982 during the Falkland Islands conflict. They retained their civil liveries and registrations throughout the conflict. Two of Haiti's five H-34As were brought to S-58T standards, while two of the three S-58s in Costa Rica were turbine powered. Thailand, after using a large number of H-34s, operated a fleet of S-58Ts as part of its Air Force. These included eighteen ex-CH-34Cs converted by Thai-Am Incorporated. California Helicopter converted twelve UH-34Ds for the Indonesian Air Force during the 1970s.

Civilian

Many retired military aircraft entered the civil arena. As in military days, they found homes around the world, and entered North American skies in large numbers. Over a dozen Canadian firms operated H-34s, with over ten times that number registering them in the United States.

Piasecki, manufacturer of the H-34's main competitor, made the most unusual use of ex-military airframes. The Heli-Stat 97-34J was designed to provide a heavy-lift machine for moving timber from remote logging sites. A skeleton structure was assembled, with the nose and fuselage of a H-34 at each of its four corners for power; a ZPG blimp bag provided lift. Unfortunately, a fatal accident due to ground resonance during a test flight put an end to the Heli-Stat.

The most widely traveled H-34 eventually found its way to the American register. Starting as part of an HSS-1N contract, c/n 1673 was built as a H-34G.III. After service in the Bundeswehr and German Navy, it was converted to S-58ET standards by Orlando Helicopter. It then appeared on the Norwegian register for A/S Helilift, went to Management Aviation in England, and back to Norway. Service in Canada was followed by a period in New Guinea on the New Zealand register and a return to Canada's Athabaska Airways. In turn, it was exported to Egabrag Aeronautics in the U.S., and finally (or, at least, most currently) was sold to Midwest Truxton in Illinois as N580US.

In less spectacular circumstances, H-34s of every type made their way to civilian use. Even the prototype for the HSS-1N was taken up after being declared surplus. Forty years after being designed, over two hundred H-34s still existed around the world.



Designed for the civil air carrier market, the S-58C's interior was far more plush and comfortable than that of VIP H-34s built for the military. The aircraft featured soundproofing and airliner type seating. (Meravo)

The TNI-AU (Indonesian Air Force) operated a number of turbine conversions of CH-34A Choctaws well into the 1990s. The aircraft were camouflaged Tan and Dark Green and flew alongside Bell UH-1s in the troop transport role. (Jake Dangle)





Argentina officially operated two S-58Ts. Serial trails for Latin American aircraft are often obscure, and H-02's is unknown. The aircraft was White with an Orange nose and rear fuselage and a Black cockpit and transmission housing.

S-58Ts, such as this Light Gray Haitian example, were often extensively reglazed. The unidentified aircraft was once either a SH-34J or a UH-34D. (Jake Dangle)



During the South Atlantic War of 1982, the Fuerza Aerea Argentina impressed a number of civil aircraft for SAR duties. Included in these were two S-58Ts, LV-OCM and LV-OCN (HUS-1 BuNo 149362). The Red cross painted on the door was intended to discourage ground fire. (Ken Hudson)





Three of the aircraft destroyed in the Heli-Stat crash were former HT-8 UH-34Js (BuNo 148940, 148945 and 148961/1363). The fourth, SH-34J 148000 ended its military life with the Reserves at NAS New Orleans. (Piasecki Aircraft)

The Los Angeles County Sheriffs Department Aero Bureau operates several H-34s from Long Beach International Airport. HSS-1N N87717 (BuNo 148011) is Black and White. LACSD aircraft were being repainted Green and Gold during April of 1991. (Author)



The YHSS-1N prototype, BuNo 143957 continues in active service as a firefighter (N9043N) with Moore Aviation in California. (Moore Aviation)

Northwestern Helicopters, Canada, uses this ex-RCAF (9632) Choctaw for fire fighting and general utility duties. (Northwestern Helicopters)





S-58C c/n 836 went from Chicago Helicopters (N869) to Sabena (00-SHQ), then to the Belgian Air Force (OT-ZKP/B15), and finally to Meravo as D-HAUG. (Meravo)



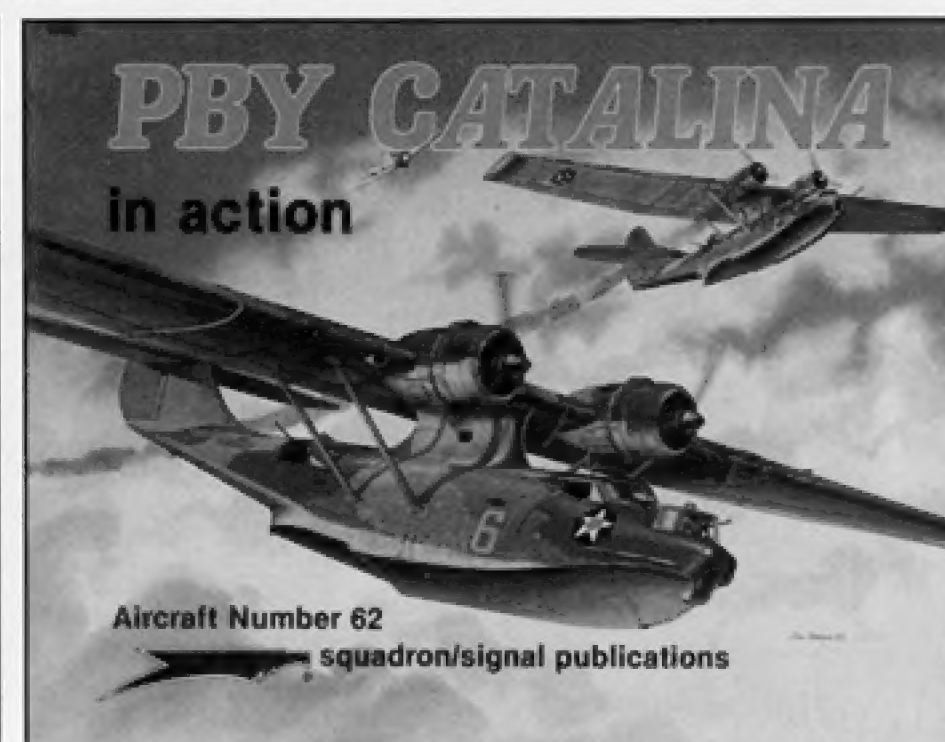
One of the impressed Helicopters Marinos S-58ETs (LV-OCN, ex-HUS-1 BuNo143962) went to Michigan's Construction Helicopters. N901CH retains the two-tone Orange of its original Court Helicopters scheme. (Construction Helicopters)



Midwest Helicopter's N580US (ex-H-34G.III 150804, c/n 1673) prepares for take-off on a job moving rooftop heating and air conditioning plant equipment for a new United Parcel Service facility in Willow Springs, Illinois. (Author)

Naval Aviation

*From
squadron/signal publications*



This Medevac CH-34C (55-4465/423) served the Army as a crash-reaction aircraft. The aircraft was overall Gloss White with high-visibility markings in Red.



ISBN 0 89747-319-1

This UH-34D (145738/787) was assigned to HMM-162 and coded YS+22. This aircraft eventually became an S-58ET and served with the L.A. County Sheriff's Department.